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GIVE
BY A

CONOMY

SUBJECT,

Year,

MOTION,

AN

INQUIRY

INTO THE

STRUCTURE & ANIMAL ŒCONOMY

OF

THE HORSE.

COMPREHENDING

THE DISEASES TO WHICH HIS LIMBS AND FEET ARE SUBJECT,

WITH PROPER

DIRECTIONS FOR SHOEING,

AND POINTING OUT

A Method for ascertaining his Age until his Twelfth Year.

TO WHICH IS ADDED,

AN ATTEMPT TO EXPLAIN THE LAWS OF HIS PROGRESSIVE MOTION,

ON

MECHANICAL AND ANATOMICAL PRINCIPLES.

The Whole illustrated by

EIGHTEEN COPPER PLATES.

By RICHARD LAWRENCE,

VETERINARY SURGEON, BIRMINGHAM.

CONTINUO PECORIS GENEROSI PULLUS IN ARVIS
ALTIUS INGREDITUR, ET MOLLIA CRURA REPONIT:
PRIMUS ET IRE VIAM, ET FLUVIOS TENTARE MINACES
AUDET, ET IGNOTO SESE COMMITTERE PONTI:
NEC VANOS HORRET STREPITUS. *VIRGIL. GEORG. LIB. 3.*

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TO

THE RIGHT HONOURABLE

LORD HEATHFIELD.

MY LORD,

GRATITUDE for the repeated favors I have received at your Lordſhip's hands, would alone prove a ſufficient inducement for me thus publickly to acknowledge them.

But when I conſider how greatly the Veterinary Art *is indebted to your generous patronage, I feel an additional incentive to dedicate to your Lordſhip theſe firſt fruits of my literary labours.*

The annals of the Veterinary College teſtify, that your Lordſhip has ever ſtood foremoſt in exertions for its intereſt and proſperity, by taking that inſtitution under your protection, and endeavouring to reſcue an uſeful animal from the baneful effects of ignorance and prejudice. That your Lordſhip may live to ſee the object of your wiſhes completely fulfilled, is the ardent prayer of

Your Lordſhip's

Moſt devoted and moſt obliged

humble Servant,

RICHARD LAWRENCE.

PREFACE.

NEXT in dignity to that branch of the medical art which is applicable to the human ſpecies, we may, with propriety, claſs that which has for its object the diſeaſes of the horſe.

IT therefore appears extraordinary, that, until a recent period, neither humanity nor intereſt ſhould have prompted mankind to inveſtigate, on ſcientific principles, the Veterinary Art, which muſt certainly be of the firſt importance in a country which abounds with the fineſt horſes in the world.

THE neceſſity of long ſtudy in anatomy, pathology, and the compoſition of drugs, to qualify a practitioner in medicine, is univerſally acknowledged*, and as the horſe exiſts by ſimilar laws, and is ſubject to many of the diſeaſes incident to mankind, it cannot require much penetration to diſcover that ſtudies of the ſame nature muſt be abſolutely requiſite to conſtitute a good farrier. But if concluſions were to be drawn from the baſis on which the veterinary ſyſtem has hitherto reſted, it would ſeem that the ſcience of farriery has been conſidered as a natural gift, and not in the leaſt dependant on the tedious proceſs of medical inquiry and inveſtigation; for every blackſmith, groom, and ſtable boy, not only conceives himſelf, but is often believed by his employer to be fully competent to the important taſk of curing diſeaſes, of the nature of which he is totally ignorant.

---

* Cicero, in his orations, makes the following juſt obſervation: "Medico diligenti, priuſquam conetur ægro adhibere medicinam non ſolum morbus ejus cui medere volet, ſed etiam conſuetido valentis, et natura corporis cognoſcenda eſt."

Surely nothing can be more abſurd than to imagine that a groom, by having fed and cleaned a horſe for a few years, muſt conſequently become acquainted with his diſeaſes and their cauſes; it would be equally plauſible to aſſert, that becauſe he knows by ocular experience, that the ſun riſes in the morning and ſets at night, he muſt be an aſtronomer. The majority of the affluent, to avoid the trouble of reflection, ſuffer themſelves to be influenced in matters of this nature by men, whoſe opinions on any other ſubject they would treat with the greateſt contempt.

Few things can be more affecting to a contemplative and humane mind, than the ſufferings of a mute and patient animal, the eſtimable contributor to our pleaſures and comforts, when afflicted with ſome violent diſeaſe in which nature exerts her utmoſt efforts to relieve herſelf; but how muſt this ſcene of diſtreſs be heightened, could the proprietor be convinced, that the very men he applies to for aſſiſtance only aggravate the evil by their ignorance.

The moſt learned and experienced phyſicians confeſs the inſufficiency of their art, and conſequently their attention is directed to the means of rendering it leſs fallible. To men of this deſcription, the infinite varieties which the ſame diſeaſe preſents in different habits, will ſufficiently demonſtrate the difficulties attending their practice; but the empyric, whoſe confidence ever keeps pace with his want of ſkill, boldly preſcribes the ſame treatment under every difference of age, ſex, and conſtitution.

CONSONANT to this was the practice of farriery, until the eſtabliſhment of the Veterinary College took place.

THE treatiſes written on the ſubject before that period, were found to be ſo fallacious in the deſcription of diſeaſes, as well as in the proportions of drugs preſcribed, that it was judged neceſſary to begin de novo. Horſes were procured for the purpoſes of diſſection, and of making experiments with regard to the quantity of different medicines which might be given with ſafety, as well as to their effects.

THE profeſſor and pupils were liberally ſeconded in their endeavours by the following gentlemen, whoſe names are ſufficient teſtimonials of their abilities, viz. Sir GEO. BAKER, Mr. CLINE, Mr. ABERNETHY, Dr. GEO. FORDYCE, Mr. J. HUNTER, Dr. BAILLIE, Mr. CRUIKSHANKS, and Mr. HOME; the latter five generouſly granted to the pupils of the college the liberty of gratuitous attendance at ſeveral courſes of their reſpective lectures. To this ſource I ſhall always be proud to acknowledge myſelf much indebted, and ſhall ever hold it in grateful remembrance.

WITH reſpect to the plan of the preſent work, it will be perceived that I have not entered very extenſively into a deſcription of internal diſeaſes, from a conviction that ſuch a treatiſe would be attended with more danger than utility.

THE internal diſeaſes of horſes, except ſome few which are well marked, are ſo obſcure as even to baffle the ſkill of an experienced practitioner in his endeavours to aſcertain them.

HENCE it cannot be expected that proprietors of horſes, from the caſual and confined obſervation furniſhed by their own ſtables, can acquire the faculty of diſcrimination in this reſpect, and the miſchief ariſing from an improper adminiſtration of medicine, muſt be ſufficiently obvious both from candid reflection and fatal experience. To confirm more ſtrongly this remark, I am in poſſeſſion of many proofs within the circle of my own employers, where horſes have fallen a ſacrifice, particularly in attempts to deſtroy worms, and yet we ſee exhibited at the window of every druggiſt's ſhop, a liſt of horſe medicines prepared from the moſt approved recipes; nor does the evil terminate here, ſince regularly educated veterinarians, bartering their better judgment for temporary intereſt, carry on the traffic in the form of medicine cheſts, with pamphlets containing directions for making uſe of their contents. This is certainly a cheap mode of conveying knowledge, and, if well founded, muſt do away at once the neceſſity of a veterinary college, and all its relative ſtudies.

But to obviate farther any diſappointment which might accrue to my readers, in not meeting in the following pages with what has been generally termed a compleat ſyſtem of farriery, I have only to add, that I have directed my endeavours to point out the means of preventing diſeaſes, and thereby to ſave the animal the pain and danger of undergoing medical diſcipline from the hands of thoſe who are unqualified for that purpoſe; and I wiſh it to be underſtood, that my motive for introducing the foregoing obſervations originated purely from the conviction, that this branch of medicine, as well as all others, would, in every point of view, be more beneficial to the public, and to practitioners themſelves, if it was diveſted of thoſe little artifices which have too long diſgraced it.

For this reaſon I have treated principally on the ſtructure and diſeaſes of the limbs, ſhoeing, management of the ſtable, &c. than which, I conceive, nothing can be more important. How far I have ſucceeded, I muſt ſubmit to the candour of the public to determine. I ſhall at leaſt poſſeſs the ſatisfaction of having endeavoured to promote the ſcience, by promulgating that theory which I have found to be true in practice.

The ſource of peculiar properties in the ſtructure and motion of the animal is, in general, but little underſtood. This branch I have attempted to elucidate upon mechanical and anatomical principles; and the explanatory plates being deſigned by myſelf, will, I truſt, be more accurate than they would have been from the hands of a ſecond perſon.

To the Profeſſor at the Veterinary College, and my Fellow Pupils, the privilege of criticiſm more immediately belongs; but I feel much confidence in the expectation of their candour and impartiality, more eſpecially when I declare, that it will always give me pleaſure to acknowledge any improvements which their induſtry and abilities may hereafter produce.

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AN ENQUIRY

INTO THE STRUCTURE AND ANIMAL ŒCONOMY OF

THE HORSE.

CHAPTER I.

On the external Conformation.

CONSIDERED in his relative ſituation in the claſs of quadrupeds, the horſe appears not to be ſo immediately conducive to the neceſſary comforts of man, as thoſe animals which furniſh food or raiment; but when his utility in agriculture, and in the tranſport of merchandiſe, as well as the ſhare he contributes to our eaſe and pleaſure, are viewed collectively, the horſe has an undoubted claim to precedence, and conſequently to an ample ſhare of attention.

THE horſe poſſeſſes ſpeed, ſtrength, and beauty, conjunctively in a degree far ſuperior to all other animals. He is alſo more docile, and more eaſily applied to the ſervice of man, whether for luxurious or laborious uſes. For the purpoſes of parade he is peculiarly adapted, by a beautiful proportion and an innate pride and grandeur of deportment, particularly manifeſt in the manege, where, by the ſpirit and elegance of his movements, he appears to participate with his rider in the oſtentatious pleaſure. When employed in the field or the race, he viſibly demonſtrates the ardour of emulation, and finally merits our gratitude, by the patience and perſeverance with which he endures the lower offices of labour and hardſhips of fatigue.

An animal poſſeſſing ſuch eſtimable qualities, muſt certainly have claims on our attention ſufficient to call forth an enquiry into his ſtructure and animal œconomy, on more ſcientific principles than has hitherto been accompliſhed.

In the expoſition of the external ſtructure, which I have attempted in the following ſheets, I certainly do not lay claim to originality in the undertaking, ſince certain French veterinary writers, particularly Bourgelat, have treated on the ſubject. The late Mr. St. Bel, who was the firſt profeſſor at the veterinary college, had it in contemplation to publiſh a work of the ſame nature, but did not live to complete his intentions; but the profeſſion of portrait painter of horſes, which I have purſued in conjunction with the veterinary practice, has directed my attention particularly to this branch of the ſcience; and the accuracy of obſervation which the eye acquires by making draughts from living objects, has probably enabled me to make more minute reſearches than might have been effected by others who poſſeſſed not the ſame advantages. The principles upon which I have founded the preſent ſyſtem, I can with truth affirm to be the reſult of experience. The data have been taken from the majority of objects in the ſame claſs, as no particular laws have yet been diſcovered which are unexceptionable in explaining the operations of nature, her productions being frequently in direct contradiction to our metaphyſical reaſoning.

As no accurate judgment in the proportions of architecture can be formed without poſſeſſing ſome knowledge of its rudiments, ſo can no experience in the proportions of a horſe be acquired without ſome general acquaintance with his external anatomy.

HABITUAL obſervation may, in ſome degree, impart the faculty of diſcriminating in this reſpect; but it can never produce a true fundamental knowledge of the advantages or diſadvantages ariſing from certain peculiarities of ſtructure.

HENCE we find every man adapts his ideas of perfection to the peculiar conformation of his own horſe.

FOR inſtance, the proprietor of a long legged horſe will tell you, that he is thereby better enabled to clear his leaps; while, on the other hand, another, who has a ſhort legged horſe, aſſures you, that no other can get ſo well through a heavy road; a third, who poſſeſſes a long backed horſe, declares that they muſt have length ſomewhere; and, finally, the dealer in horſes, who keeps fifty in his ſtables, ſums up the buſineſs on a broad ſcale, and anſwers all your objections by aſſerting that they will go in all forms.

It would be thoroughly incompatible with the object of the preſent work, to ſuffer it to be biaſſed by ſuch vague opinions, generated rather by partial compariſon, than by actual experiment.

They who have no knowledge of mechanical powers, will, perhaps, ridicule the idea of reducing the animal to any ſuch principle. Anatomical diſſection, however, preſents a machine of the trueſt mechaniſm, capable of locomotion by means of muſcles acting upon bones in various directions.

THIS being the fact, it will not be difficult to diſcover in what way the power of thoſe muſcles may be increaſed or diminiſhed, not entirely by their own ſuſceptibility of ſtimulus, but ſimply by their poſition when in a ſtate of inaction. To explain this theory, will be the object of the preſent chapter.

THE body and legs of the horſe, excluſively of the head and tail, may be ſaid to form nearly a ſquare, as repreſented in plate I.

THIS ſquare is divided horizontally into two parts, nearly equal, by the body and legs, as repreſented by the line A A.

IT is again perpendicularly divided into three parts, as expreſſed by the lines B C.

THE firſt of theſe lines B, deſcends perpendicularly from the withers to the ground, and gives the proportion of the fore quarters.

THE ſecond line C divides the body from the hinder quarters, and ſhews their proportion. Theſe three diviſions are nearly equal, except that the center diviſion is rather the wideſt.

THE neceſſity for this general proportion will be explained hereafter.

THE head ſhould be ſmall, and the countenance animated; the forehead ſtraight and broad, the eye prominent, the ears erect, the noſtrils open and thin, the mouth lean and deep, the poſterior part of the lower jaw ſhould be open and capacious, which contributes much to the freedom of bending the head inwards, and is alſo conſidered to facilitate reſpiration.

THE form of the ear is admirably adapted for the purpoſe of collecting ſound; and it is worthy of remark, that a horſe ſeldom ſleeps without pointing one ear forwards and the other backwards, to enable him to receive notice of the approach of objects in either direction.

THE horſe's ſenſe of hearing is very acute, and it is a fact pretty well known by ſportſmen, that he can hear the cry of the hounds at a greater diſtance than his rider. Hence it will ſcarcely be neceſſary to point out the abſurdity of cropping; yet there exiſts another bad cuſtom, nearly as injurious as the former, viz. trimming the hair cloſe out of the ears. The utility of hair in that part conſiſts in moderating ſound, excluding cold air, rain and flies, and other extraneous ſubſtances, which might otherwiſe drop into the ear*. The method of trimming the ears is by ſingeing the hair with a candle, and as the ear itſelf is frequently injured and rendered ſore by this proceſs, the horſe in conſequence becomes ſhy of any thing approaching his head.

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* The ears of all animals are defended in ſome peculiar manner. The mole which lives under ground, and whoſe ear is conſtantly expoſed to the ingreſs of earthy particles, has the faculty of cloſing that orifice by means of a ſphincter muſcle.

The human ear alſo ſecretes a fluid, which, being waxy and coheſive, arreſts the progreſs of inſects and duſt, and prevents their entrance.

THE form of the mouth and lips clearly indicates that the animal was intended to be guided by the bit, as there are no teeth in that part to prevent the action of it againſt the bars of the mouth. Lean lips are moſt ſenſible of impreſſion, and are therefore to be preferred.

As deformity is conſtituted by a want of harmony in the component parts, it will not be difficult to perceive, that a long head and a ſhort neck, or a ſhort head and a long neck, cannot be eſteemed handſome.

THE neck ſhould proceed in a line from the top of the head, forming a regular progreſſive curve to the withers. The trachea or windpipe ſhould be large in diameter, and ſomewhat detached from the fleſhy part of the neck. The ſize of its diameter has a conſiderable influence in reſpiration. Large windpipes are peculiar to blood horſes, whence, probably, they are better winded than all others. The chief beauty of the forehand depends on the union of the neck with the ſhoulders. The neck ſhould iſſue high, and nearly in a line with the withers, and its lower part ſhould enter the cheſt high, and above the point of the ſhoulders: the oppoſite conformation to this produces what is termed an ewe neck, which can never be eſteemed handſome.

THE ſhoulders conſtitute the center of motion in the fore part of the body, and the extent and elaſticity of that motion will depend chiefly on the poſition of the ſhoulder blades. The connexion of the ſhoulder blades with the body is eſtabliſhed by muſcles only, independently of any joint whatever. It is by the alternate contraction and extenſion of theſe different muſcles that motion is produced, and it is by their united elaſticity that the ſhock is broken when in action.

THIS would not have been the caſe, had the ſhoulder terminated in a fixed joint. The truth of this remark may be aſcertained by riding alternately on the withers and the croupe, and comparing the difference of their reſpective motions.

As it is the office of the hinder quarters to propel the body forwards, it is neceſſary that they ſhould be cloſely united with the body by means of joints. But, on the other hand, as the fore quarters are chiefly employed in ſuſtaining the equilibrium of the machine, the concuſſion which muſt have been produced if they had been united to the body by joints, would have been conſiderably greater than what is produced by their being attached by muſcles only. In deſcribing the action of the ſhoulder, it will be neceſſary to conſider its poſition when in a ſtate of immobility.

The ſcapula or blade bone is placed obliquely from the cheſt to the withers, and the center of its action is fixed in the middle of it. In its action, it deſcribes as large a portion of a circle as the extenſion of its muſcles will admit. If this portion of a circle, for inſtance, be ten degrees, and two different ſcapulæ poſſeſs the ſame degree of extenſion, the one ſituated obliquely *(vide plate* 2, *fig.* 1) the other perpendicularly *(fig.* 2) it muſt neceſſarily follow, that, acting on their reſpective centers, the one which is oblique muſt elevate its lower extremity higher than that which is perpendicular, and conſequently will increaſe the projection of every part of the fore limb. Hence it appears, that an oblique poſition of the ſhoulder is moſt favourable for progreſſion.

THE ſhoulder may want liberty either by being too fleſhy or too lean. In the firſt inſtance it is overloaded, and in the laſt, it poſſeſſes not muſcle ſufficient to enable it to perform its functions with ſtrength and celerity.

THE muſcles of the cheſt contribute greatly to the motion of the lower part of the ſhoulder. Hence a ſtrong and moderately full cheſt, is to be preferred to one that is narrow and meagre. It will probably be urged, that horſes are ſometimes poſſeſſed of great ſpeed, whoſe forehands in no wiſe agree with this deſcription; but ſuch horſes are generally endowed with particular powers in their hinder quarters. The fore quarters are merely paſſive, and extend themſelves to receive the weight of the body, and if they are ſufficiently ſtrong for that purpoſe, the animal may certainly move with conſiderable velocity; but thence it is not to be inferred, that a greater velocity might not be produced if both the fore and hinder quarters were alike perfect in their conformation.

THE fore legs will next come under conſideration, on the good ſtructure of which the ſafety and eaſe of the pace of the animal will chiefly depend.

A horſe, whoſe legs are twiſted, or improperly placed too far under his body, may poſſeſs great ſpeed; but that his action muſt be imperfect, the following reaſons will ſufficiently demonſtrate:

If the foot turns either inwards or outwards, it cannot alight flat on the ground, in which caſe the poſition can never be firm and ſteady, becauſe the preſſure will be partial on either the inward or outward quarter of the foot. If the leg is not perfectly ſtraight from the ſhoulder to the foot (*vide plate* 3, *fig.* 1) its action cannot be true, nor the center of gravity ſo readily found, as by one that is even and uniform in all its parts (*fig.* 2). If the elbow inclines inwards cloſe to the ribs (*fig.* 1, A A) the leg muſt be thrown ſideways when in action, which will remove the foot too far from the center of gravity, and produce a lateral rolling motion very unpleaſant to the rider. Again, if the legs incline too much under the body, they will be overloaded, and the freedom of their action will be reduced in proportion as they are oppreſſed.

The fore legs, to be perfect, ſhould, in a front view, be wideſt at the cheſt, gradually approaching each other downwards towards the foot, and deſcending in a perpendicular direction to the ground, as exemplified in *plate* 3, *fig.* 2.

The upper part of the fore leg next the ſhoulder, ſhould be broad and muſcular.

The power of elevating the knee, and throwing the leg forwards, depends much on the ſize of the muſcles in this part.

The knee in a front view ſhould be broad, flat, and ſquare; the lower part of the limb, between the knee and the fetlock, ſhould be ſhort, flat, and wide in a lateral view. The tendons ſhould be diſtinct, firm, and detached from the bone. The fetlock ſhould correſpond in proportion with the reſt of the leg, neither too upright nor too ſloping. If it is too long, its ability of ſuſtaining the weight of the body will be diminiſhed; and if it is too ſhort, it will be liable to knuckle over. Short paſterns are generally attended with contracted feet, the weight of the body not being thrown ſo much on the heel as is the caſe with long paſterns.

The general proportion of the limb is conſtituted by two equal diviſions, viz. from the elbow to the knee, and from the knee to the ground.

The length of the fore leg ſhould correſpond with that of the hind leg, that is to ſay, the elbow D, ſhould deſcribe a horizontal line with the ſtifle E, *plate* 1, otherwiſe the harmony of motion is loſt, as is the caſe in a carriage, where the fore wheels are of a ſmaller diameter than the hinder wheels, on which account they are obliged to perform three revolutions to two of the latter.

THE BODY

Contains the principal viſcera and organs of life. The common appellation of this part, amongſt horſemen, is the carcaſe; thus a horſe is ſaid to be long or ſhort in the carcaſe. A horſe which is ſhort in the carcaſe, is uſually ribbed home, as it is termed, that is to ſay, there exiſts but a ſmall ſpace between the laſt rib and the hip bone. This conformation is juſtly eſteemed excellent. A horſe thus formed is generally ſhort in the back and wide in his loins, and better adapted to carry weight and bear fatigue than a horſe of a different form.

Horses of this deſcription, however, are commonly ſuppoſed to be deficient in ſpeed, from the idea that they have not ſufficient length. But when it is conſidered that the carcaſe has no motion of itſelf, but is entirely acted upon by the quarters and extremities, it is manifeſt that the length ſhould exiſt in theſe parts, and not in the body. In proof of this, two horſes may be found exactly of the ſame length from the point of the ſhoulder, at the cheſt, to the point of the buttock, and yet one horſe ſhall be long in the carcaſe, and the other ſhort. *Vide plate* 5, *fig.* 1 *and* 2.

The difference conſiſts in the one having longer quarters than the other, and this is undoubtedly the form to be preferred.

The fore part of the carcaſe contains the heart and lungs, and ſhould therefore be ſufficiently capacious to admit of a free action in thoſe viſcera. Horſes with flat ribs experience a greater preſſure from the atmoſphere in their breathing, than thoſe do which have their ribs more arched, conſequently they are not ſo well adapted for reſpiration. The poſterior part of the carcaſe contains the ſtomach and inteſtines, and is generally round and capacious in horſes of a ſtrong conſtitution. The back ſhould ſink in a ſmall degree behind the withers, and proceed in a ſtraight line to the end of the loins, and thence fall gradually to the tail. A hollow back renders the motion of the animal eaſier to the rider, but certainly cannot be ſo ſtrong as one that is ſtraight. A roach or hog back conſtantly throws the ſaddle forwards on the ſhoulders.

The loins ſhould be wide, and the hips low. The diſtance of the point of the buttock from the hip ſhould be conſiderable. The lower part of the buttocks, in a poſterior point of view, ſhould be wider than the hips (*vide pl.* 4, *fig.* 2, *l.* A A). The tail ſhould iſſue from the croupe in a regular progreſſive curve, and not appear as if it was ſtuck into the rump.

The hinder quarters may properly be conſidered as the main ſpring of the whole machine. This is clearly demonſtrated by the ſuperior ſize of the muſcles, and the angular poſition of the thigh bones.

It has generally been the cuſtom to attribute the ſource of motion principally to the fore quarters, under the idea, that if the fore quarters could move well and with ſpeed, the hinder quarters muſt naturally follow. The fallacy of this doctrine may be eaſily expoſed. In the action of a ſelf-moving body, the poſterior part generally conſtitutes the fixed point from whence the motion takes its origin. Thus, if the horſe leans forwards, the center of gravity ceaſes to be ſupported, and he is obliged to advance one of his fore legs in order to recover the equilibrium. Again, if the chief ſource of motion exiſts in the fore quarters, whence does it ariſe that many good fore-quartered horſes are bad leapers? The reaſon is obvious: from weakneſs in their hinder quarters; for the principal ſtrength of a horſe lies in the muſcles of his thighs. Therefore a horſe may riſe well at a leap, and clear it with his fore legs, but cannot bring his hinder legs over, unleſs the muſcles of his thighs are ſufficiently powerful.

It may be urged, that leaping differs from galloping; but galloping is, in reality, conſtituted by reiterated leaps on a plain ſurface. Hence the neceſſity of a good conformation in the hinder quarters*.

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* A ſtrong inſtance in favour of this doctrine may be adduced in the celebrated horſe Eclipſe, who was unqueſtionably the moſt ſpeedy horſe of his day.

His fore quarters were very ill formed, and his ſhoulder low; but his hinder quarters were particularly ſtrong and muſcular.

THE hinder quarters commence from the center of the back, and continue to the tail, including the hinder legs.

WHEN viewed in a lateral direction, the diſtance from the hip bone to the point of the rump ſhould be very conſiderable. *Vide pl.* 1, *l.* I K.

THE ſtifle (E) ſhould fall perpendicularly in a direct line under the hip (I). By this means the length of the thigh bone (from L to E) is increaſed, and its poſition rendered more oblique and angular. The leg from the hough to the ground ſhould be perpendicular, and exactly under the hip joint. *Vide* L L.

THE thigh above the hough ſhould be broad and muſcular (M M); the hough wide, flat, and lean. The width of the hough mechanically increaſes its powers, by removing the acting muſcle to a greater diſtance from the joint, thereby lengthening the lever. The utility of the above conformation in the hinder quarters, conſiſts in furniſhing a greater length to the haunch and thigh bones, without adding to the volume of the part wherein they are contained, and without removing the foot too far from the center of gravity. The hinder quarters, when viewed from behind, ſhould appear wider from ſtifle to ſtifle (A A, *pl.* 4, *fig.* 2) than from hip to hip (B B). Herein may be traced a ſtrong characteriſtic of the blood horſe.

THE hips of the blood horſe are lower and narrower, proportionably, than thoſe of the cart horſe; on this account he is ſuppoſed to be weaker than the latter; but this is not the fact. For if the croupe of a blood horſe is meaſured from hip to hip, the ſpace will be found (proportionably) to be as large as that of a horſe with wider and higher hips *(vide pl.* 4, *fig.* 1) becauſe the ſurface is more circular, which, if extended flat, would occupy as wide a ſpace. Hence it is evident that the blood horſe, in this inſtance, poſſeſſes as large a proportion of muſcle, although it is concentrated into a circular form.

THE leg ſhould be perpendicular from the hough to the ground, as exemplified in *fig.* 2, *l.* c c, and the houghs not too cloſe to each other, which is vulgarly termed cat or cow-houghed. *Vide fig.* 1, *l.* A A, *ſame plate.*

HORSES of this deſcription have, in general, the reputation of ſpeed; but not altogether with juſtice. In this poſition of the leg, a greater portion of weight muſt be thrown on the hough than if it was upright. Moreover, it is clear, that a moving part muſt be impeded in its action in proportion as it is oppreſſed, and this oppreſſion is ſufficiently manifeſt by the production of thorough pins, curbs, ſpavins, and weakneſs in the fetlock joint, commonly called knuckling over; injuries to which horſes of this mould are peculiarly ſubject.

THE foregoing remarks upon the external conformation, apply only to the mechanical advantages to be derived from a peculiar conſtruction of the component parts. The force of the muſcles not being directly proportioned to their bulk, but being in a compound ratio of their ſize and denſity or elaſticity, the latter not being viſible, the force can only be aſcertained by experiment, that is, by a trial of the animal.

HAVING thus conſidered the external conformation of the animal, the next object of inquiry will be the ſtructure and œconomy of the foot, than which nothing can be more important. For be the fabric ever ſo beautiful, yet if the foundation is not good, it holds its perfection by a frail tenure, which the progreſs of time at length totally annihilates.

THE FOOT

CONSISTS of three principal parts, viz. the wall or cruſt, the ſole, and the frog.

THE wall or cruſt is the part which iſſues immediately from the coronet, and grows downwards to the ground.

It is compoſed of a firm horny ſubſtance, which becomes harder the nearer it approaches the toe. It conſiſts of two ſets of fibres, circular and perpendicular.

The circular fibres ſurround the whole, and by their contractile power, prevent the ſides of the hoof from burſting aſunder. The degree of denſity in theſe fibres, will depend on the texture of the ſkin from whence they originate, and, on this account, the hoofs of blood horſes are commonly much harder and more compact than thoſe of cart horſes, whoſe ſkin is of a more ſpongy nature.

The ſole forms the bottom of the foot, and is cloſely connected with the wall, which connexion may be diſtinguiſhed at a ſmall diſtance from its edges. The ſole is naturally concave, and if the wall is firm, and poſſeſſes ſufficient contraction, it will have the property of an arch.

The frog is a ſubſtance projecting above the ſurface of the ſole, and occupies the poſterior part of the hoof. Its form is wedge-like, with its point terminating in the center of the ſole, and is admirably adapted to give ſtability to the foot by its reſiſtance to ſlipping. It is ſofter than the reſt of the hoof, and ſerves as an elaſtic cuſhion for the terminating point of the flexor tendon of the foot.

THE heels conſtitute the poſterior part of the hoof, and are compoſed of the reduplication of the wall, forming a ridge to the ſide of the frog. This part is called the bar or binder of the foot, and tends conſiderably to keep the heels apart from each other.

THE foot of a colt, antecedently to being ſhod, deſcribes nearly a circle, of which the heels conſtitute the wideſt part (*vide plate* 6, *fig.* 2). The hoof contains the leſſer paſtern bone, the coffin bone, and the navicular bone. The coffin bone occupies the largeſt part of the cavity of the hoof as cloſely as the kernel of a nut within the ſhell. It is connected with the hoof by laminæ, which ariſe both from the inward ſurface of the hoof, and the ſurface of the bone *(vide fig.* 4). Theſe laminæ maintain their connexion with each other by the attraction of coheſion; they alſo contain innumerable ramifications of blood veſſels and nerves. The compoſition of this part is ſingularly beautiful; for if the coffin bone and hoof were not ſeparate from each other, the growth of the hoof downwards could not have been carried on independently of the parts contained within it; thus we find the connexion exiſts by the attraction of theſe laminæ to each other, and which are folded together like a fan, in order to occupy leſs ſpace, and yet, if expanded, would furniſh a ſurface twenty times the circumference of the foot.

WITHIN the coronet, at the ſides of the hoof, are placed two cartilages, in the ſhape of a half moon. Theſe cartilages cover the larger branches of the arteries, and furniſh a defence againſt injuries, ſuch as treads and overreaches. They alſo prevent the coronet from preſſing on the blood veſſels and nerves which ſurround that part.

The foot is ſubject to many defects, which will be conſidered under the article of ſhoeing.

CHAPTER

CHAPTER II.

On the EYE.

THE great utility of ſight to animals which enjoy the faculty of locomotion, muſt render an inquiry into the diſeaſes of that organ peculiarly intereſting.

INFLAMMATORY attacks on the eye of the horſe, eventually producing blindneſs, are ſo general as almoſt to ſanction a belief, that he is naturally more ſubject to this infirmity than any other animal. Such a ſuppoſition, however, would tend more to arraign the wiſdom of Providence, than to throw any light on the ſubject. A difference in the perfection of the eye, as well as of other parts of the body, certainly prevails amongſt different horſes;

but not to ſuch a degree as to occaſion blindneſs, provided the animal remained in a ſtate of nature. Unnatural confinement in hot and dark ſtables, the conſtant coſtiveneſs produced by dry food, and more eſpecially a general derangement of the ſyſtem brought on by violent and exceſſive exertions, are undoubtedly the primary cauſes of diſeaſed eyes. The neceſſity of ſpeedily counteracting inflammation in the eye, muſt be ſufficiently manifeſt, when the reader is informed, that a total and irrecoverable privation of ſight frequently takes place in twenty-four hours.

THE local ſituation of the eye is ſo familiar to every one, that it is ſcarcely neceſſary to deſcribe it. It is placed ſideways in the head of the horſe, as well as in all other animals who preſerve themſelves from danger by flight*. This poſition of the eye enables him, in ſome degree, to ſee behind him, and to kick againſt an adverſary with greater certainty. The anatomy of the horſe's eye varies, in ſome inſtances, from the human eye, although the functions are preciſely the ſame. The pupil of the human eye is circular in its form, that of the horſe oblong. By this formation, the horſe's eye takes in objects horizontally to a much greater extent than the human.

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* This poſition of the eye is common to hares, birds, and ſeveral other animals. An inſtance has occurred of a hare, when cloſely purſued by a dog, having her eyes ſo attentively fixed on the object behind her, as to run againſt a tree, and to be ſtunned by the concuſſion.

THE muſcles which move the horſe's eye, are ſeven in number; in the human eye there are but ſix. The ſeventh ſeems to be adapted for the purpoſe of retracting the eye within the orbit, to ſhield it from injury, and alſo to ſuſpend it in the action of grazing. It differs alſo from the human eye by being furniſhed with a membrane, ſituated at the anterior corner (*vide pl.* 7, *l.* c). This membrane is common to moſt quadrupeds*, as well as to birds. The anatomical name for this membrane is Membrana Nictitans; but, perhaps, it will be more readily underſtood under the appellation of Hawes. Farriers are ſo univerſally ignorant of the uſe of this membrane, that they conſider it as a diſeaſe, and under that idea remove it by exciſion. The pernicious conſequences of this practice will be explained hereafter.

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* The monkey is an exception to this rule.

THESE are the principal points in which the eye of the horſe differs from that of the human being: a more minute and technical explanation would be, perhaps, both unintereſting and unintelligible to the majority of my readers.

THE external ſurface of the eye, in its healthy ſtate, is thoroughly tranſparent.

THE center of it,which is denominated the pupil, is generally of a dark indefinite colour. The pupil has the property of contracting or dilating itſelf, in proportion to the ſtrength of light which enters the eye. *Vide plate 7; letter* A repreſents the eye in an obſcure light. *Letter* B, in a ſtrong light. The non-enjoyment of this faculty is a certain indication of blindneſs. To examine a horſe's eyes properly, he ſhould be placed under a ſtable door, with his head facing the light. In this ſituation the pupils of both eyes ſhould be exactly of the ſame dimenſions. As he advances more into the light, the pupils ſhould contract; but if either of them does not contract, the horſe is certainly blind of that eye.

THE diſeaſe which occaſions this ſpecies of blindneſs is termed, in pathology, the Gutta ſerena, and ariſes from a palſy in the optic nerve. It is ſo little perceptible, that few but anatomiſts can detect it.

ANOTHER cauſe preventing the impreſſion of light on the optic nerve, is more perceptible, but equally incurable, viz. an opacity in the ſurface of the cryſtalline lens through which the rays of light paſs to the retina.

The cryſtalline lens is a pellucid tranſparent convex body, ſituated immediately behind the pupil*. It frequently becomes opaque, in conſequence of general inflammation in the globe of the eye. In this ſtate the ſurface of the lens, which preſents itſelf in the cavity of the pupil, aſſumes a greyiſh aſpect, and in the confirmed ſtate it becomes perfectly white.

At the commencement of this diſeaſe, ſmall grey ſpecks, about the ſize of a pin's head, are ſometimes perceived in the pupil, ſo ſmall as not to interrupt the entrance of light; but the preſence of theſe ſpecks is a certain indication that the eyes have been attacked at ſome former period (*vide pl.* 7, *l.* D). The appearance of the eye in an inflamed ſtate, whether from external injury or from a bad habit of body, is nearly the ſame. The ſurface becomes cloudy and opaque, and frequently a yel-

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[*] The cryſtalline lens is more or leſs convex in different animals. In fiſh it is perfectly ſpherical, as the aqueous medium which ſurrounds them, renders a greater refraction of the rays neceſſary to viſion.

a yellowiſh red, and ſometimes green fluid is ſeen floating in the anterior chamber of the eye. The opacity of the outward ſurface is produced by the coagulable lymph being forced between the laminæ of the tranſparent cornea, but is generally miſtaken for a film covering the outward part of the eye; hence the pernicious cuſtom of blowing powdered glaſs, and other irritating applications, into the eye, is reſorted to with a view of eroding it.

THE blood veſſels of the tunica conjunctiva, or white of the eye, are turgid during inflammation. In this ſtate the light is painful, and, in order to prevent its entrance, the eye-lids are generally cloſed. When the eye-lids are opened by the hand to examine the ſtate of the eye, the membrana nictitans or hawe is brought, by the animal, conſiderably over the ſurface of the eye, to ſupply momentarily the office of the eye-lids, in preventing the acceſs of light. *Vide plate* 7, *l.* c.

THIS temporary appearance of the hawe the farrier miſtakes for a diſeaſe, and generally removes it by cutting it away. The hemorrhage and ſuperficial irritation produced by this means, ſometimes relieve the eye; but the ſubſequent effects are an expoſure to inflammation, created by the preſence of any extraneous ſubſtance, ſuch as duſt, hay-ſeeds, &c. which, from the loſs of the hawe, the animal is diſabled from wiping away.

INFLAMMATION in the eyes is often produced by plethora, from want of ſufficient exerciſe. In this caſe topical applications alone are not to be depended upon. Evacuations to a very conſiderable degree are abſolutely neceſſary.

Two or three quarts of blood may be taken, and the bowels may be kept in a laxative ſtate by mild purges, ſuch as four drachms of aloes given at a doſe, night and morning, until they operate; the horſe to be fed with bran maſhes, and the ſame precautions attended to as are generally obſerved in phyſicking.

The beſt lotion which can be applied, is a mixture of one-fourth vinegar to three-fourths of water, to be uſed with a clean ſpunge and light hand very frequently. A rowel under the jaw, or bliſters applied to the cheeks, will be found highly uſeful, together with regular exerciſe, juſt ſufficient to produce a moiſture on the ſkin. Draught horſes of every deſcription are probably more ſubject to inflamed eyes, ariſing from the preſſure of the collar preventing a free circulation of blood in the head.

Young animals are more diſpoſed to local inflammation than old ones, from the blood veſſels not having acquired the habit of ſufficiently reſiſting the increaſed force of the circulation; hence horſes are more ſubject to diſeaſed eyes before their ſixth year than afterwards.

THE mode of treatment here recommended will, in general, remove the inflammation, but will not prevent its return, except proper attention is paid to the management of the animal. It is certain that this diſeaſe ariſes moſt frequently amongſt horſes which are highly fed, and not ſufficiently exerciſed, and, in proof of this fact, many inſtances occur where horſes have recovered perfect ſight and retained it, in conſequence of regular labour in a mail coach or poſt chaiſe.

THERE is another deſcription of imperfect eyes, commonly called Moon Eyes or Buck Eyes. This term originated probably from ſome peculiar influence which the moon was ſuppoſed to have upon them, as the inflammatory attacks are generally periodical. In this diſeaſe the eye is uſually ſmaller than the common ſize, and its outward appearance is cloudy and of a greyiſh colour. The animal alſo is much addicted to ſtarting at objects, particularly at ſhadows and reflections from water.

The ſame rules, with regard to regimen and exerciſe, will be found uſeful in this complaint.

EXTERNAL inflammation of the eye-lids, with a flowing of the tears down the cheek, is frequently occaſioned by an obſtruction in the lachrymal duct, which opens into the cavity of the noſtril. In this caſe water ſhould be ſyringed up the duct, or ſome ſtrong ſnuff may be blown into the noſtrils to produce ſneezing.

CHAPTER III.

On SHOEING.

IF the ſurface of the earth had remained in its natural verdant ſtate, the neceſſity of an artificial defence for the horſe's foot would not have exiſted. But ſince it has been found more convenient to the general intereſt of the community to conſtruct roads of hard materials, ſhoeing the animal has become an unavoidable evil.

FROM the firſt moment a colt is ſhod, the conteſt between nature and the blackſmith may be ſaid to take place.

THE foot of a colt, as already deſcribed, is concave in the ſole, it will therefore be obvious, that the moſt prominent parts of the ſole muſt come more immediately into contact with the ground.

The parts which are moſt prominent are the wall, the binders, and the frog. Theſe parts, therefore, conſtitute the chief ſupport of the foot.

When the horſe is ſhod, the inward ſurface of the ſhoe becomes the ſupport of the foot inſtead of the ground; hence it will not be irrational to conclude, that the nearer this ſupport reſembles the ſurface of the earth, the better it will be adapted to the foot.

The quarters and heels are naturally capable of an elaſtic expanſion when the hoof is not ſhod. This elaſticity contributes to facilitate the circulation of the blood through the foot, to furniſh a ſpring to the action of the leg, and to leſſen concuſſion. It has been before obſerved, that the foot poſſeſſed three points of ſupport, viz. the wall, binders, and frog. But the common method of ſhoeing completely fruſtrates this deſign, for the ſhoe being made concave and thick at the heels, the points of contact are thereby reduced from three in number unto one, that is to ſay, the wall of the hoof only. This concavity of the ſhoe next to the ſole, counteracts the elaſtic expanſion of the quarters and heels, by conſtantly preſſing them towards each other. The thickneſs of the heels alſo elevates the frog above the ground, and prevents the preſſure which its texture and uſe require. Nature, faithful to her laws, reſiſts injury with her utmoſt efforts, but, unfortunately, is unable to counteract the continued application of an injudiciouſly conſtructed ſhoe.

Hence the miſchief ariſing from bad ſhoeing is ſlow in its progreſs, but fatally certain in its effects. For if the alteration of the form of the hoof, and the conſequent lameneſs, were produced inſtantaneouſly,

ouſly, conviction would immediately follow, and even the moſt uninformed would detect the erroneous ſyſtem. The practice of ſhoeing, therefore, ſhould be adapted ſolely as a defence to a part which is already perfect, and which ſtands in need of no alteration whatever from its original form.

The greateſt merit which a blackſmith generally aſſumes, is built upon his dexterity in ſhoeing a bad foot, where much caution and preciſion is required in driving the nails ſo as to keep the ſhoe faſt without injuring the animal. But if he would beſtow even one half of this cleverneſs in attentively conſidering the primitive ſhape of the foot and its component parts, his abilities and his time would be employed to a much better purpoſe. It will be fruitleſs, however, to expect reformation from men who are ſo firmly bigotted to their old maxims, that neither precept nor example can make the ſmalleſt impreſſion upon them.

THE plan to be purſued in ſhoeing a perfect foot will be as follows:

To pare the wall juſt ſufficient to make it level; to pare the ſole as much as will be neceſſary to remove the dead ſurface which endeavours to detach itſelf by ſcaling off ſpontaneouſly; the frog to be cleared of its ragged edges; the heels not to be ſcooped out, nor notched in any way whatever. The ſhoe for a ſound foot to be about three quarters of an inch broad in the web, and of an equal thickneſs from toe to heel; the ſurface next the hoof to be half flat and half bevilled, except at the heels, which ſhould be entirely flat, ſo as to preſs on the bars as well as on the heels.

THE nails ſhould be eight in number, four on each ſide, and inſerted principally near the front of the hoof, ſo as to leave the heels as much at liberty as poſſible.

IN order to ſave trouble, it is a common practice with blackſmiths to apply the ſhoe hot, and burn down the hoof until it correſponds with the ſurface of the ſhoe. This method ſhould never be tolerated on any pretence whatever, for it dries up the natural fluid of the hoof, deſtroys the pores, and renders the cruſt, to a conſiderable extent, perfectly inſenſible, and alſo cauſes it to be ſo brittle, as to be incapable of holding the nails in their reſpective ſituations. It has been before obſerved, that the ſhoe ſhould be half flat and half bevilled. By being half flat, it will embrace a ſmall portion of the ſole as well as the wall, and although it is generally aſſerted, that the ſole will not endure preſſure from the ſhoe without injury, yet daily experience will ſufficiently prove the contrary.

If the whole weight of the animal is ſuſtained by the wall of the foot only, the preſſure will be partial, the concuſſion more conſiderable, and the ſole will gradually ſink and become flat, and even convex or *pumied.*

The ſhoe ſhould never be made of a ſmaller diameter than the foot, particularly at the quarters.

This plan, however, is generally purſued from the apprehenſion of the horſe's cutting his fetlock joints from the feet being too broad. But a horſe ſeldom cuts whilſt his feet are ſound and free from pain, except from a natural malpoſition of his legs.

He is more liable to cut when his tread becomes wavering and unſteady by being cramped and pinched from bad ſhoeing. The foot ſhould not be raſped too much below the clenches of the nails, as it is thereby partially weakened, and loſes its ſtraight direction from the coronet to the ground.

The nails ſhould be as ſmall as poſſible, and in a wedge-like form at the head, by which means they will retain their hold with greater effect.

The foregoing rules are pointed out for the purpoſe of ſhoeing a perfect foot, which has not been injured either by accident or diſeaſe; and if they are ſtrictly adhered to, will generally enſure a continuance of that perfection. But this method, however excellent in principle and confirmed by experience, may be eaſily brought into diſrepute by an injudicious application.

THIS misfortune frequently occurs from the unqualified oppoſition of blackſmiths in general, who, to uſe the words of Tacitus, will ever be found "Conſilii quamvis egregii, quod ipſe non afferret inimicus."

THEIR low cunning is ſufficiently fruitful to point out to them, that the ſudden reduction of a horſe's heels which have been accuſtomed to thick concave ſhoes, will be productive of conſiderable pain and temporary lameneſs, and will thereby furniſh them with an opportunity of aſſerting the juſtice of their predictions reſpecting the fallacy of the new mode of ſhoeing. Hence, if a horſe with high and contracted heels, is ſent to a blackſmith with orders to have them reduced moderately at every time of ſhoeing, he ſeldom lets ſlip the opportunity of bringing on the conſequences before mentioned, by executing the orders to an extreme.

Nor is this the only inſtance wherein he has it in his power to pervert the preſent ſyſtem of ſhoeing. For if a flat narrow ſhoe is recommended as the beſt adapted for a good foot, the ſame party will apply it to a pumied or convex ſole, knowing, at the ſame time, that a foot of that deſcription cannot poſſibly bear it.

In this caſe the proprietor of the animal, who, probably, is not ſufficiently verſed in the art of ſhoeing to detect ſuch iniquitous ſchemes, diſcovers that his horſe is lamed, and, unfortunately for his future intereſt, poſſeſſes a ſtill higher opinion of his blackſmith's abilities, and thenceforth condemns the veterinary college and its doctrines in toto. But notwithſtanding all their objections to the new ſyſtem of ſhoeing, the defenders of the old mode cannot diſprove this deplorable fact, that there is ſcarcely one horſe in a thouſand, at ſix years of age, that is perfectly ſound in his feet.

PUMIED OR CONVEX SOLE.

THIS alteration of the original form of the ſole is ſometimes produced by inflammation in the foot, and frequently by bad ſhoeing only. When it is the reſult of inflammation, the horſe is ſaid to be foundered, and the coffin bones to be ſunk. This diſeaſe ſeldom admits of a cure. But when the convexity of the ſole has ariſen from bad ſhoeing, the only method by which permanent relief can be obtained, will be by running at graſs, without ſhoes, for ſix months at leaſt. As the complaint is brought on, in a great degree, by partial preſſure on the wall of the hoof by hollow-webbed ſhoes, nothing can be ſo conducive to the reſtoration of the primitive form of the foot, as a general preſſure on the ſole and frog, by which means the wall of the hoof will be leſs impeded in its growth, and will be thence enabled to recover its original ſtrength and texture.

THIS is to be effected by no other means than by remaining at graſs, barefoot, for a conſiderable length of time.

As the front of the foot loſes, in this diſeaſe, its natural ſtraight direction, and becomes curved as it approaches the ground, it is neceſſary that the toe ſhould be kept as ſhort as poſſible, in order to counteract this tendency. The heels, frog, and binders, however, ſhould be left untouched.

THIS plan will conſiderably improve the ſhape of a pumied foot; but a complete re-eſtabliſhment of the original concavity of the ſole is not to be expected. The ſhoe which is proper for a pumied foot varies, in ſome degree, from that which is adapted to a perfect foot. Its internal ſurface muſt correſpond, in ſome meaſure, with the convexity of the ſole; but not more than is abſolutely neceſſary

ſary to admit a picker between them. The heels of the ſhoe to be kept as flat as poſſible, with a view to bring the frog into contact with the ground; the nails to be inſerted principally round the toe. By bevilling the ſhoe from the outward edge of the web to the inward edge, a flat ſurface will be preſented to the ground, which will certainly be more firm and ſteady than one that is convex. The caution againſt applying a hot ſhoe, is particularly neceſſary to be attended to in the preſent caſe.

CONTRACTED HOOF

Consists of a contraction of the heels of the hoof, and is, moſt indubitably, the offspring of bad ſhoeing (*vide plate* 6, *fig.* 1). Other circumſtances, however, may concur in producing it, ſuch as a natural diſpoſition to heat in the foot, increaſed by ſtanding in the ſtable, or running thruſhes, or it may be brought on by the horſe's not preſſing on the foot, in conſequence of lameneſs in any other part of the leg.

When the contraction exiſts to a great degree, a perfect cure is not to be obtained. Hence the neceſſity of counteracting it on its firſt appearance. Contraction in the hoof cannot take place ſuddenly, as the internal parts of the foot will reſiſt it for a certain length of time; but the continued preſſure of the quarters will ultimately produce an abſorption in the coffin bone, which is obliged, in this manner, to adapt itſelf to the diminiſhed capacity of the hoof. Feet which are diſpoſed to contract, generally poſſeſs great ſtrength and thickneſs in the wall or cruſt, and this contractile power muſt be greatly increaſed by the common practice of notching the heels, paring the frog and ſole to an extreme, and ſhoeing with convex ſhoes with thick heels, thereby preventing the frog from touching the ground. In this caſe the frog, for want of preſſure, will be diſeaſed and waſted in ſubſtance, and the animal will become unſafe in his progreſſion whenever he happens to tread on a ſtone, or any other projecting ſubſtance. Corns alſo commonly attend feet of this deſcription, from the heels being bound both by the ſtrength of the walls and the bad conſtruction of the ſhoe. In the worſt ſtate of a contracted hoof, the ſole is ſometimes ſo preſſed upon laterally by the quarters, as to be forced upwards againſt the fleſhy ſole in ſuch a manner as to cauſe great pain.

THIS is denominated by the French, an encaſtelated hoof. It is eaſily diſtinguiſhed by a preternatural concavity in the ſole.

A cure is often attempted by ſcoring the hoof perpendicularly from the coronet to the ground, raſping the quarters to the quick, and applying a ſcrew ſhoe.

BUT attempts of this kind to produce a ſudden alteration in the dimenſions of the hoof, will be found totally uſeleſs, if not injurious. The diſeaſe is brought on gradually; the remedy, therefore, muſt be gradual, as the texture of the hoof is too firm and tenacious to yield haſtily to artificial impreſſions. If the horſe is worth the trouble and expence, the moſt probable means of effecting a cure will be either to turn him out barefoot, or to oblige him to ſtand without ſhoes on the bare ſtones during the day, and to litter him down at night as uſual.

THE pavement of the ſtall, however, ſhould be perfectly level, by which means the heels will be preſſed upon properly, and will progreſſively expand. The quarters may be moderately raſped, and the heels to be pared as low as poſſible. This proceſs to be repeated once monthly at leaſt.

WET rags may be tied looſely over the coronet, to be wetted frequently in the courſe of the day. This plan, however, muſt be perſiſted in for a conſiderable length of time to produce the deſired effect. But it happens ſometimes, unfortunately, that the internal parts of the hoof, ſuch as the bones, cartilages, and ligaments, are diſorganized beyond recovery. In this caſe an expanſion of the hoof will be productive of little benefit, from the impoſſibility of reſtoring to theſe parts their natural functions and elaſticity.

It is a practice with moſt farriers to draw the ſole with a view to effect a cure; but, independently of the barbarity of this operation, it will ever be found uſeleſs, and will rather have a tendency to increaſe the diſeaſe, by removing one of the principal ſources of reſiſtance to the contraction of the walls of the foot. Yet we ſee on the ſhop door of every village blackſmith, horſes ſoles nailed up in regular order---trophies of his ignorance and his cruelty.

CORNS.

This troubleſome diſeaſe alſo takes its origin from bad ſhoeing.

A corn is generally produced by a partial preſſure of the ſhoe, from its fitting too hollow, or by the ſhoe being too ſhort, and indenting itſelf into the heel.

THE blood being forced into the horny fibres of the hoof, gives it ſometimes a red, and ſometimes a black appearance.

THE concomitant inflammation is frequently ſo great, as to cauſe internal ſuppuration of the laminated ſurface of the hoof, even up to the coronet. In this caſe the corn ſhould be properly laid open with a drawing knife, to procure a free egreſs for the matter downwards, and a bar ſhoe ſhould be applied, in order to remove the preſſure from the heel unto the frog. As ſoon as the injured part is healed, the beſt and moſt radical mode of cure will be to harden its ſurface by an equal preſſure, which will be beſt effected by the horſe's remaining ſome weeks without ſhoes.

DISEASED FROG,

Commonly called a RUNNING THRUSH.

THIS diſeaſe attacks the frog of the foot, extending from its center up to the cleft of the heels, and if neglected, terminates ſometimes in a canker.

IT is often improperly attributed to a bad habit of body, and, on this account, it has been ſuppoſed to be dangerous to attempt its removal. A running thruſh, however, is more frequently produced by bad ſhoeing, than by any other cauſe, as we daily find that horſes of all habits of body are ſubject to it. In caſes where the diſcharge from the frog has been of long ſtanding, it is poſſible that the ſyſtem may experience ſome temporary inconvenience by the ſudden privation of an outlet to which it has been for ſome time accuſtomed, but hence we are not to ſuppoſe that an evacuation, which is not natural, ſhould be eſſential to the health of an animal, except it is brought on as a critical termination of ſome other diſeaſe.

Quadrupeds are not ſubject to periodical diſcharges, ſuch as menſtruation or hæmorroidal fluxes, and in this inſtance they are more perfect in their œconomy than the human being. The frog, in its healthy ſtate, is a firm elaſtic ſubſtance, ſomewhat ſofter than the reſt of the hoof. The form of it clearly points out its uſe, viz. to give ſtability to the foot, to ſerve as a baſis for the flexor tendon of the leg, and to furniſh elaſticity to the poſterior part of the hoof.

But the common method of ſhoeing would lead to a ſuppoſition, that not one of theſe properties belonged to the part in queſtion, and by this means the intention of nature is fruſtrated in every inſtance. The frog being, by thick heeled ſhoes, deprived of preſſure againſt the ground, becomes ſoft, from the accumulation of the natural fluid which it ſecretes, in this part, in great abundance, from the fatty ſubſtance which lies immediately under the aponeuroſis of the flexor tendon. This accumulation of fluid, at length, makes its eſcape through the fiſſure of the frog and heels, and acquires, by expoſure to the atmoſphere, a fetid ſmell, and an acrimonious quality ſufficient to erode the adjacent parts. In this ſtate the frog becomes ſo ſore and irritable, as not to endure preſſure without a very painful ſenſation. But the miſchief does not terminate here. The frog naturally conſtitutes a point of reſiſtance to the heels, and in conjunction with the bars of the hoof, prevents them from approaching each other; but when it is thus deſtroyed by diſeaſe, it no longer performs that office, and the heels conſequently contract and produce an incurable lameneſs. Hence, the neceſſity of counteracting this diſeaſe in its infancy, muſt be ſufficiently evident.

The diſcharge may be ſtopped by aſtringent applications; but no permanent cure can be obtained without ſuch a method of ſhoeing as will bring the frog into contact with the ground, and thus, by preſſure, increaſe its ſurface and harden its ſubſtance.

OIL of turpentine, or blue vitriol diſſolved in vinegar, may be applied daily to the part.

THE heels of the hoof to be pared as low as poſſible, and the heels of the ſhoe to be made very thin.

COLTS at graſs are ſometimes ſubject to diſeaſed frogs; but this occurs only in caſes where the walls of the hoof are exceedingly ſtrong, thereby preventing the heels from being ſufficiently worn down ſo as to bring the frog into contact with the earth. Soft and wet paſtures alſo contribute to the ſame bad tendency. Here likewiſe the heels ought to be pared down very frequently.

IF the diſeaſe has exiſted ſo long as to have inſinuated itſelf between the horny and fleſhy ſoles of the foot, it is then termed a canker, and muſt be treated in the following manner: Firſt, it will be neceſſary, with a drawing knife, to remove all that part of the horny ſole which the diſcharge has detached from the fleſhy ſole, or, in other words, all that part which is hollow underneath. The diſeaſed ſurface being thus expoſed, is to be dreſſed with a cauſtic, ſuch as butter of antimony, or nitrous acid and water, equal parts, and ſome dry tow or powdered lime to abſorb the diſcharge. When this plan has been purſued, the cure will afterwards depend upon the application of preſſure to the part affected. The ſole being, in fact, a plexus of blood veſſels, granulations ariſe much more rapidly there than in any other ſituation, hence they are better checked in their exuberance by preſſure than by cauſtic, which always puts nature to the expence of regenerating the ſurface.

QUITTOR,

Or ULCER *in the Coronet of the Hoof.*

WOUNDS on the coronet, between hair and hoof, occaſioned either by treads or overreaches, may be eaſily cured by waſhing the part thoroughly clean, and applying ſome tow ſteeped in ſpirits of wine, and a moderate degree of preſſure, ſo as to bring the divided parts as near as poſſible to each other. By theſe means they generally heal by the firſt intention.

BUT if they are neglected in their origin, or are improperly treated by the uſe of cauſtic or violent dreſſings, they become fiſtulous ulcers, ultimately rendering carious the cartilages and bones of the foot. In this ſtate they are called quittors.

A quittor may alſo ariſe from the foot being pricked in ſhoeing, and the matter forcing itſelf through the coronet.

When the ulcer has arrived at this ſtate, the original cauſe will be immaterial, the treatment muſt be uniform in this particular, viz. to get to the bottom of the ſinus. The number, depth, and direction of the ſinuſes may generally be aſcertained by the probe.

If there is only one ſinus, the orifice may be enlarged with the knife, and ſome butter of antimony may be introduced, at the ſame time dreſſing the ſurface with common digeſtives; but if there are more ſinuſes, and in a tortuous direction, it will be neceſſary to lay the whole open, and to cut away all the diſeaſed part, after which it becomes a ſimple wound. This operation ſhould be performed by a ſkilful hand, as there is danger of injuring both the capſular ligament of the coffin joint, and the principal artery running to the foot.

A quittor frequently leaves a deformity in the growth of the hoof, which is denominated a falſe quarter. This ariſes from the regenerated ſubſtance in the coronet producing an unequal ſhape afterwards. It will afterwards be neceſſary, in ſhoeing, to avoid driving any nails near the part, if poſſible.

CHAPTER IV.

The GREASE.

IN treating of the diſeaſes of the legs, it will be proper to begin with thoſe which are external.

THE greaſe is ſo common a complaint, as to require little or no deſcription of its appearance. It has hitherto been uſually aſcribed to a groſs and foul habit of body, and the cuſtomary meaſures of bleeding, purging, and rowelling have been, and continue to be adopted for the attainment of a cure.

IN this diſeaſe, as well as in all others, it will be neceſſary firſt to aſcertain the prediſpoſing cauſe, on ſound principles, before we can proceed to the adminiſtration of medicine. The neceſſity of this baſis is ſeldom or never conſidered, and foulneſs, humours, &c. are aſſigned indiſcriminately to horſes of all ages, habits, and conſtitutions, and cæteris paribus, the ſame mode of treatment is uniformly perſiſted in.

Experience has proved that this mode of treatment is not always attended with ſucceſs, and it remains to enquire into the cauſes of its failure. The original cauſe of the greaſe is debility in the ſyſtem. Other circumſtances, however, concur in its production, which will be noticed in their proper places. Debility may ariſe from directly oppoſite cauſes, viz. repletion and exhauſtion.

The healthy ſtate of all animals is conſtituted by a due and regular circulation of the blood, and an uniform maintenance of the natural evacuations of the body.

Whatever diſturbs any of theſe functions will produce debility. In a full plethoric habit, the veſſels which are appropriated for the circulation of the blood become oppreſſed by being overloaded, and are thus rendered incapable of performing their office. Hence debility takes place, and the legs, which, by their ſituation, are moſt remote from the center of circulation, and through which the blood has to return in oppoſition to its own gravity, become ſwelled for want of the accuſtomed abſorption. On the other hand, when the horſe is lean and emaciated, either from want of a ſufficient quantity of nutritive food, or from exceſſive labour, the circulation of the blood will be languid from a deficiency of ſtimulus, and debility will naturally enſue.

BIBL. COD. R. COLL. OMN. ANIM. OXON.

In addition to either of the above-mentioned cauſes, the following may be given as collateral promoters of the diſeaſe, viz. the ſeaſon of the year, unnatural confinement in the ſtable, the acclivity of the pavement of the ſtall, cutting the hair off the heels, and want of proper exerciſe and cleaning.

In the winter ſeaſon, at which period the greaſe is moſt prevalent, the inſenſible perſpiration of the body is not ſo regular, nor ſo profuſe, as in the ſummer; but nature generally provides againſt this decreaſe, by increaſing the diſcharge of urine, and the expiration of vapour from the lungs; and this mode of expulſion would be fully ſufficient for the purpoſes of the animal œconomy, if the horſe remained in a ſtate of nature. But it is far different with him in a domeſticated ſtate, in which he is alternately expoſed to a warm and cold atmoſphere, as he is within or without the ſtable. The ſecretion and evacuation of urine is diſturbed in its proceſs, by forcing him to proceed in his labour at the moment when the fulneſs of the bladder ſtimulates him to diſcharge its contents; and although the perſpiration may be increaſed to an exceſſive degree by exerciſe, and which might be ſuppoſed to compenſate for deficiencies in other reſpects, yet it will be found, that the reſult of exceſſive labour and perſpiration will be a proportionate debility, whereas the inſenſible perſpiration is a tranquil and imperceptible evacuation, carried on without putting nature to any expence of corporeal powers. The bad effects ariſing from the foregoing cauſes, are conſiderably aggravated by confinement to one ſituation, probably during eighteen hours out of the twenty-four. The pavement of the ſtall being on an aſcent, will throw three-fourths of the weight of the body on the hind legs, and will alſo diſtreſs them by the toe being placed upon higher ground than the heel, whereby the ligaments and membranes are kept conſtantly diſtended. Under theſe unfavourable circumſtances the legs ſwell, a rupture of the ſkin eventually takes place, and a ſerous diſcharge enſues, which, by expoſure to the atmoſphere, acquires a fetid and acrimonious quality. As the diſeaſe advances, the part affected becomes extremely ſore and irritable, ſo as to give exceſſive pain to the animal when he moves the limb; at the ſame time the excoriation ſpreads, deſtroys the roots of the hair, and creates a chancrous or puſtulous induration of the ſkin, underſtood in farriery by the appellation of grapes.

When the diſorder has arrived at this ſtate, the horſe is generally ſuppoſed to be foul and full of bad humours. Bleeding, purges, and diuretics are made uſe of, during the action of which the fluids are abſorbed and evacuated, and the legs are relieved. This temporary abſorption, however, ſerves but to palliate the complaint, for its ſubſequent effects will be an increaſe of the original debility, and with it an increaſe of the diſeaſe.

This objection to purges, it will be neceſſary to inform the reader, includes only thoſe of the ſtrong draſtic kind.

As the horſe is generally coſtive in the ſtable, mild aperients will undoubtedly prove ſerviceable; but draſtic purges generally increaſe the coſtiveneſs after their effects have ſubſided. If the horſe has proper exerciſe, diuretics will, in general, remove the complaint.

BUT antecedent to pointing out the mode of cure, it will be expedient to enquire into the conſequences of the practice of cutting the hair off the heels.

So arbitrary is cuſtom, that it frequently occurs that practices are perſiſted in, which, by a proper inveſtigation, would be found to be moſt directly contrary to truth. Under this head we may claſs the foregoing. The common opinion upon this ſubject is, that the hair harbours dirt, and prevents the legs from being properly cleaned. Under this poſition, its removal certainly would appear neceſſary. But when it can be proved that this hair does not harbour dirt, but, on the contrary, prevents its acceſs to the limb, it will be no difficult taſk to ſhew its utility.

NATURE has cloathed the animal with hair for the obvious purpoſe of defending the ſkin from the contact of the atmoſphere. Other membraneous parts, ſuch as the noſtrils and the eyes, are ſhielded, with the ſame intention, by peculiar ſecreted fluids, which in a ſtate of health conſtantly cover their ſurfaces. The inward ſurface of the noſtrils is kept moiſt, in order to preſerve the ſenſe of ſmelling; and the outward ſurface of the eye is kept moiſt, in order to preſerve its tranſparency.

Both of theſe faculties would be deſtroyed by the contact of atmoſpheric air, which, by drying the ſurface of the noſtril, would render it incapable of ſmelling; and which alſo, by drying the ſurface of the eye, would corrugate it, and render it opaque by the multiplicity of refractions which would ariſe from its irregularity.

As the body is thus defended with hair, it accordingly follows that thoſe parts which would, if they were naked, be moſt expoſed to water and dirt, are furniſhed with a greater portion of this covering. Hence the hair on the lower part of the leg is conſiderably longer than elſewhere. This is ſufficiently manifeſt in horſes which are bred in cold marſhy ſoils, ſuch as Holland, Flanders, and many parts of England.

If a leg of this deſcription, with the hair on it in its natural ſtate, is examined after paſſing through the dirtieſt roads for ſeveral hours, when the hair is divided by the hand to inſpect the ſkin, it will be found that the external part only is wet, whilſt the internal part, together with the ſkin, will have remained perfectly dry and free from dirt. In this ſtate it will be only neceſſary to waſh the dirt off the hair on the outſide, and leave it to dry by its own evaporation. On the other hand, if the hair has been cut off cloſe to the heels, both water and dirt will have acceſs to them, and when the paſtern bends during progreſſion, a very conſiderable friction is produced, which muſt conſequently irritate the ſurface of the ſkin. When the animal returns from his daily labour, the legs are waſhed with cold water, and except they are well rubbed with ſtraw or the hand (a benefit which ſeldom falls to the lot of ordinary horſes) they are ſuffered to become dry in a natural way; but whilſt this evaporation is going on, the legs are extremely cold for two or three hours, and the ſkin being deprived of its own fluid, which it ſecretes in order to preſerve its pliancy, becomes corrugated and inflamed, and ſwelling of the cellular membrane enſues, with all its bad conſequences.

In objection to this doctrine it will probably be argued, that blood horſes are not thus furniſhed with long hair on their legs. But it muſt be conſidered, that the blood horſe is not originally the produce of this country. The climate in which he is generated is much warmer, and the ſurface of the ſoil is generally ſandy and free from moiſture. In this country, however, his legs are well protected by the cloſeneſs of the hair, for his ſkin, which is finer and more compact in its texture than that of the cart horſe, produces three hairs in the ſame ſpace as would be occupied by two only in the latter. Independent of this property, his natural habit is more vigorous, and leſs ſubject to thoſe diſeaſes which attend habits of the indolent and phlegmatic kind.

THE neceſſity of a covering to the ſkin of animals which are much expoſed to the cold elements, may, in an analagous point of view, be carried ſtill farther, viz to water-fowl and fiſh.

THE body of the firſt is completely enveloped in feathers, which, being oily on their ſurfaces, repel water for a great length of time. The legs are defended by a ſcaly coat. When the fowl is inclined to waſh his feathers, he rubs off the oil with his beak whilſt in the water; but as ſoon as his feathers are dry, he oils them again by rubbing his beak againſt his rump, which ſecretes a greaſy fluid, and afterwards applies it to every part of his body.

Fish, which are conſtantly expoſed to water, throw out, on the ſurface of their bodies, a mucus which prevents the contact of that element.

In ſlight attacks of the greaſe, a cure may generally be effected by employing ſuch medicines internally as will increaſe the urinary and perſpiratory diſcharges, and by attending to cleanlineſs and moderate exerciſe.

The following ball may be given every other night for four or five nights:

Emetic Tartar,	- -	2 drachms
Venice Turpentine,	-	½ ounce
Liquorice Powder,	-	1 ounce

Mixed together into one ball.

The heels may be dreſſed at night, after being well waſhed with ſoft ſoap and warm water, with the following lotion:

Vinegar,	- - -	half a pint
Water,	- - -	half a pint
White Vitriol,	-	one ounce

Mixed.

IF the diſeaſe has been of long duration, and has become exceedingly virulent in its effects, purges muſt be adminiſtered, and a rowel introduced in ſome convenient part.

THE purging ball may conſiſt of

Aloes (Barbadoes) -	9 drachms
Ginger, - - - -	1 drachm

to be given when the horſe has been prepared for two days with bran maſhes; warm water to drink during its operation, and alſo warm cloathing. The ball to be repeated in eight days.

As the ulcers in the heels are generally more inveterate in a caſe of this kind, the following detergent lotion will be neceſſary, viz.

Nitrous Acid, - - -	1 ounce
Water, - - - - -	1 pint

Mixed,

to be applied every night. The following poultice will alſo prove beneficial:

Powdered Charcoal and Oatmeal, equal quantities, made into a poultice with cold beer grounds.

CHAPTER V.

On LAMENESS.

LAMENESS, which does not originate from any diſeaſe in the hoof, may be divided into three kinds, viz. of the muſcles, of the tendons and ligaments, and of the bones. Lameneſs which has its ſeat in the bones, ariſes from adventitious and diſeaſed oſſifications in different parts of the extremities, and which are commonly diſtinguiſhed by the following terms, viz.

SPLENT,
RING BONE,
STIFF JOINT, OR ANCHYLOSIS,
BONE SPAVIN.

THE ſplent is one of the moſt common diſeaſes incident to the fore legs. The proximate cauſe is inflammation in the bone, produced ſometimes by concuſſions of the limb from quick riding upon hard roads; or by blows from the oppoſite leg during progreſſion, which is called the ſpeedy cut. It is a hard immoveable excreſcence, ſituated on the ſhank bone, and moſt frequently on the inſide of the leg. *Vide plate* 8, *fig.* 2, *letter* A.

It more generally attacks young horſes, their bones not having acquired the firmneſs which belongs to a more advanced age. Splents are ſuppoſed not to occaſion lameneſs, unleſs they ariſe under a tendon or near a joint. Lameneſs, however, will enſue from their exiſtence in any ſituation. The bone of the leg, in common with all other bones, is ſurrounded by a firm inelaſtic membrane, ſtrongly adhering to its ſurface, and which is called Perioſteum.

When the bone is inflamed in any particular part, an increaſed ſecretion of bony matter is brought on in that part, and an enlargement of the bone conſequently takes place. In this ſtate, the bone (which, when free from diſeaſe, is perfectly inſenſible) becomes extremely irritable, and the pain which the animal experiences from the concuſſion of the limb when it alights on the ground, is ſufficient to occaſion lameneſs.

This ſenſibility of the bone will continue until the perioſteum yields, and adapts itſelf to the increaſed ſubſtance which is contained within it.

If the ſplent is generated under a ligament, or under a tendon, it increaſes the lameneſs; for, by diſplacing the ligament, or the tendon, from their natural ſituations, it more or leſs impedes their functions, until they adapt themſelves to their new direction. Inſtances have occurred of an abſorption of ſplents, without any external application; but caſes of this kind are ſo rare, that it would not be prudent to truſt to ſo precarious an event. The beſt mode of treatment conſiſts in repeated bliſters applied to the part, and cold water and bandage between the periods of their operation.

THE RING BONE

Is an oſſified enlargement of the leſſer paſtern bone at a ſmall diſtance from the coronet of the hoof, ſometimes producing a ſtiff joint. *Vide pl.* 8, *fig.* 3, *letter* c.

THE cartilages of the foot are alſo ſometimes oſſified. This laſt diſeaſe occupies nearly the ſame ſituation as the ring bone, but is totally different from it. In the ring bone, the joint of the leſſer paſtern is affected. In the oſſified cartilages, the lameneſs ariſes from their having loſt their elaſticity.

BLISTERING will ſuffice for both caſes in an incipient ſtate; but if they are of long ſtanding, or very rapid in their progreſs, firing will be abſolutely neceſſary.

STIFF JOINT, OR ANCHYLOSIS,

Is moſt commonly the conſequence of wounds through the capſular ligament of the joint. When the capſular ligament is perforated by any accidental injury, the ſynovia or fluid, which is ſecreted for the purpoſe of lubricating the heads of the bones in their action with each other, eſcapes outwards. Great irritation and inflammation attend this ſtate of the wound, probably from the action of the atmoſpheric air which enters it. If the capſular ligament is not ſpeedily healed, or its divided edges brought into contact with each other, ſo as to prevent the ſynovia from continuing to flow through the orifice, the membranes begin to thicken, and bony matter is thrown out from the heads of the bones, which unites them into one ſolid maſs, and the uſe of the joint is irrecoverably loſt.

WOUNDS of this deſcription require a very different treatment from all others; for relaxants and emollients tend but to increaſe their bad properties.

As ligaments are not ſo vaſcular as muſcles, they are conſequently much ſlower in forming granulations, or, in other words, they do not poſſeſs ſo completely the powers of regeneration. Hence, as ſoon as it is aſcertained that the ligament is perforated, the injured part ſhould be ſtimulated by an active cauſtic, ſuch as butter of antimony, or elſe by the application of the actual cautery to the edges of the wound. The external ſurface may be dreſſed with common digeſtive ointment, and the whole defended as much as poſſible from the air.

BONE SPAVIN

TAKES place on the upper end of the bone of the hind leg, adjoining the lower and inſide part of the hough, where it forms a round bony excreſcence. *Vide plate* 8, *fig*. 6, *l*. F.

THE hough is more frequently the ſeat of lameneſs, than any other part of the hind leg; and young horſes, whoſe houghs ſtand obliquely, which is commonly termed cow-houghed (*vide pl.* 4, *fig*. 1) are particularly ſubject to this complaint. It is produced generally by ſome partial exertion in the hough bringing on inflammation and a depoſition of bony matter.

THE lower part of the joint of the hough is compoſed of ſeveral ſmall bones, which, though they are exactly fitted to each other, and occupy one common cavity, yet poſſeſs a diſtinct ſeparate motion independent of each other. The utility of this conformation conſiſts in furniſhing greater elaſticity to the joint than it would have poſſeſſed had this part been compoſed of one ſolid maſs. When the inflammatory attack commences in this part, oſſeous matter is thrown out, and an union of theſe ſmall bones enſues, forming together a hard ſubſtance, perceptible not only to the touch, but to the eye. When an union of theſe bones has taken place, their original individual motion and elaſticity will be loſt, and the reſult will be an incurable lameneſs. The favorable criſis for the removal of this complaint is on its firſt attack, before the exoſtoſis is formed, for a horſe will frequently be lame for a conſiderable time before the ſpavin makes its appearance. But an unaccountable propenſity which grooms and farriers have to fix upon either the whirl-bone or the ſtifle, as the ſeat of lameneſs in the hind extremities, induces them to apply the remedy to thoſe parts; and during the time which is waſted in this injudicious proceſs, a ſpavin is formed beyond the poſſibility of being eradicated. A cure is often attempted by the application of cauſtics, and even by the mallet and chiſſel; but as neither of theſe methods will ſeparate the ſmall bones which have been united into one maſs, and thereby reſtore their former functions, they conſequently will be found uſeleſs. Frequent bliſters ſhould be reſorted to on the firſt attack, and if theſe do not ſucceed, the part ſhould be fired without loſs of time.

Lameness in the ligamentary and tendinous parts conſiſts of

STRAINS of the SHEATH of the TENDONS,
RUPTURE of the SUSPENSOR LIGAMENTS of the LEG,
THOROUGH PINS,
BLOOD SPAVINS,
BOG SPAVINS,
CURBS,
WINDGALLS,
INJURY in the COFFIN JOINT,
INJURY in the WHIRL-BONE,
INJURY in the STIFLE.

STRAIN *of the* SHEATH *of the* TENDONS.

This will probably be better underſtood by the common term of ſtrain in the back ſinews, which generally ſhews itſelf on the back part of the leg above the fetlock. *Vide plate* 8, *fig.* 1, *l.* B.

It may be brought on by ſudden and violent exertion, or by a blow from the toe of the hind foot, which accident often occurs in hunting over heavy land, in which caſe the fore leg is prevented from extricating itſelf in time to avoid the toe of the hind leg.

The injury very rarely exiſts in the tendon itſelf, but is more commonly confined to the ſheath which ſurrounds it. Camphorated ſpirits of wine well rubbed on the part affected, and a moderately tight bandage dipt in cold water, will effect a cure, if applied immediately.

But if the complaint has been of long duration, ſo as to have become callous, repeated bliſters will be neceſſary.

RUPTURE *of the* SUSPENSOR LIGAMENTS *of the* LEG.

This may happen to either the fore or hind leg. It is generally and improperly ſuppoſed to conſtitute a rupture of the tendon or back ſinews. When the ſuſpenſor ligaments are ruptured, the fetlock joint is incapable of preſerving its natural oblique poſition, on which account it becomes ſo horizontal as nearly to touch the ground. But as the flexor muſcles ſtill poſſeſs the power of bending the leg (which they could not do if the tendons were ruptured) it is manifeſt that the ligaments, whoſe office it is to maintain the proper poſition and connexion of the ſhank and paſtern bones, are alone the parts affected. A perfect recovery is ſeldom obtained, from the impracticability of confining the limb in a manner that would be moſt favourable to a re-union of the divided parts. A ſhoe with a high heel, and a bandage round the leg, are the moſt likely means of promoting a cure. The re-union of the ligament, however, does not reſtore the original poſition of the leg, the horſe, therefore, decreaſes much in value.

WINDGALLS

PRESENT themſelves in the form of ſmall puffy ſwellings above the fetlock joint, and are common to both fore and hind legs. *Vide pl.* 8, *fig.* 2, *l.* D.

THEY are conſtituted by the relaxation of the burſa mucoſa, and are produced by hard labour, and, probably in a great meaſure, by the horſe being obliged to ſtand up hill in the ſtall of the ſtable.

BLISTERING, reſt, and a level pavement, are the beſt remedies*.

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* I have had opportunities of aſcertaining the good effects of a level pavement in reſtoring a horſe's legs, in the ſtables of a Nobleman in Warwickſhire, who does me the honour to employ me.

A horſe which his Lordſhip purchaſed, had all his legs conſiderably affected with windgalls, which totally diſappeared in ſix months, without the aſſiſtance of any external application whatever.

THOROUGH PIN

Is a diſeaſe of the ſame nature as the windgall. Its ſituation is in the hough, and may be diſtinguiſhed by a ſmall round ſwelling, which yields to the preſſure of the finger. *Vide pl.* 8, *fig.* 5, *l.* I. It is brought on by the ſame cauſes as the windgall, and requires the ſame treatment.

BLOOD SPAVIN.

The diſeaſe ſo called is ſimply a relaxation of the vein running over the front of the hough. *Vide plate* 8, *fig.* 6, *l.* G.

It very rarely occurs, and never produces lameneſs; but it is commonly miſtaken for another complaint, denominated the

BOG SPAVIN,

Which conſiſts of an inflammation and diſtenſion of the burſa mucoſa, or the part ſurrounding the ligament of the hough. This enlargement occaſions a protruſion of the vein which lies immediately upon it, and hence the diſeaſe has been erroneouſly ſuppoſed to occupy the vein.

REPEATED bliſters are here alſo neceſſary.

THE CURB

Is manifeſted by a ſwelling on the back part of the hough. *Vide pl.* 8, *fig.* 5, *l.* H. It is occaſioned by a ſtrain in the annular ligament or ſheath of the tendons, the office of which is to keep the tendons in their proper ſituations.

THIS complaint prevails moſt among young horſes, particularly thoſe which are cow-houghed.

BLISTERS muſt be employed alſo in this caſe.

LAMENESS *in the* STIFLE

SELDOM occurs, except from external injury, in which caſe it makes itſelf apparent by the ſwelling of the ſurrounding parts. Camphorated ſpirits of wine may be applied once daily until a cure is effected.

LAMENESS *in the* WHIRL-BONE,

Or the ARTICULATION *of the* THIGH BONE *with the* PELVIS.

IN this caſe the ligaments of the joint are probably principally affected. The whole part, however, is ſurrounded by ſuch maſſy and powerful muſcles, as to be protected, in a conſiderable degree, from injury. When the animal is lame in this ſituation, he drags the leg after him on the toe. Camphorated ſpirits of wine will be found uſeful in a recent caſe; in an old injury, recourſe muſt be had to bliſters.

LAMENESS *in the* COFFIN JOINT.

ALTHOUGH the ſeat of this lameneſs is within the hoof, yet, as the ligaments of the joint are the parts affected, it was thought moſt proper to claſs it with ligamentary lameneſs. From its ſituation, it is the moſt dangerous lameneſs that can befal a horſe, and it is very rarely overcome, except the remedy is applied on the commencement of the malady. It is uſually to be diſcovered by the ſenſation of great heat round the coronet, by the horſe not bringing his heel to the ground, and by his ſtanding with his leg advanced before him as much as poſſible.

THE ſame propenſity which farriers have to aſcribe the lameneſs of the hinder quarters to the whirl-bone and the ſtifle, prevails alſo in this caſe; for except they can feel ſome enlargement or external mark of injury in the leg, they always fix upon the ſhoulder as the part affected.

UNDER that perſuaſion they apply the remedy to the ſhoulder, during which time the diſeaſe becomes incurable; for although the ligaments of the coffin joint might recover by reſt, yet the means which the animal himſelf employs for that purpoſe, namely, by ſtanding with the lame leg advanced before him, brings on a contraction of the hoof, which, in its conſequences, is equally as detrimental as the firſt complaint. Bliſters ſhould be applied to the coronet on the firſt appearance of lameneſs, and repeated as occaſion may require.

MUSCULAR LAMENESS

INCLUDES all diſorganization of the muſcles of the extremities, whether from external injury, immoderate exertion, or loſs of tone from the influence of cold, producing rheumatiſm or ſpaſm.

THE ſhoulder is ſometimes impeded in its action by muſcular lameneſs, which may ariſe from a blow, or from violent extenſion of the leg in paſſing over a ſlippery ſurface. It is diſtinguiſhed from lameneſs in any other part by the horſe's dragging his toe, and deſcribing a circular motion outwards with the leg, which motion is occaſioned by the want of action in the pectoral and adductor muſcles, on which account the abductor muſcles act alone without reſiſtance from the adductors, and draw the leg outwards when the animal is put into motion. Camphorated ſpirits of wine may be rubbed on the ſide of the cheſt and under the arm of the lame leg, daily until a cure is effected.

RHEUMATISM.

As it is difficult, perhaps impoſſible, to aſcertain the exiſtence of this complaint, it will be unneceſſary to treat upon it.

SPASM

Is rarely a partial affection, but generally attacks the whole frame, producing univerſal rigidity and loſs of motion in the muſcles. This being connected with internal cauſes, the cure will depend principally on the adminiſtration of ſudorifics, viz. emetic tartar, two drachms every night, until the ſymptoms are removed.

STRINGHALT

Is cauſed probably by a convulſive action of the flexor muſcles of the hind leg, whereby the leg is raiſed higher, and bended more in the hough and ſtifle than is neceſſary. An attempt to explain its origin would, perhaps, tend neither to its elucidation nor to its removal.

RECAPITULATION.

In concluding this chapter it will be proper to ſtate, that a peculiar conformation of the limbs renders a horſe more ſubject to lameneſs of one kind than another. Thus horſes with ſhort paſterns, and whoſe fore legs incline much under the body, are moſt liable to bony excreſcences, ſuch as ſplents, ring bones, and oſſified cartilages of the foot, all of which, in a great meaſure, ariſe from concuſſion, for a horſe whoſe legs ſtand far under him, will put them down during progreſſion in a perpendicular direction, whence the concuſſion will be greater than when the leg is advanced before the body, and alights in an oblique direction. Contracted heels alſo are generally the fruits of this conformation. Horſes with long paſterns are more liable to ligamentary lameneſs than others; but as the great length of the paſtern gives more pliancy and elaſticity, they are conſequently leſs expoſed to thoſe diſeaſes of the bones which ariſe from concuſſion, ſuch as ſplents, ring bones, &c.

Horses which are cow-houghed are particularly ſubject to ſpavins, curbs, and thorough pins, owing to the malpoſition of their legs.

The tendency to lameneſs of every deſcription is greatly aggravated by the acclivity of the ſtall of the ſtable, and by working the animal at too early an age. In the mode of treatment recommended in the foregoing caſes, it will perhaps be remarked, that the formulæ do not poſſeſs much variety; but in caſes where an immediate effect is required, it is certainly beſt to employ thoſe remedies, the efficacy of which has been eſtabliſhed by experience, than to waſte time in fruitleſs experiments with leſs active materials. Therefore, as lameneſs ariſing from diſeaſe in the bones, whether it occupies the coronet of the foot, or the hough of the hind leg, may be reduced to the ſame principles, it follows that the ſame preſcription will be adapted for the attainment of a cure in either caſe.

FARMERS and breeders of horſes ride them from three years of age, until their legs and feet, from premature exertion, are ſo much injured as to render their ſoundneſs doubtful, and this ſtate often comes on before they are ſix years old. Under theſe circumſtances they are offered for ſale, and generally warranted perfectly ſound. But although ſuch horſes do not manifeſt lameneſs in any particular leg, by a want of harmony in their motion, yet their injured ſtate may be detected by their ſtepping ſhort with their fore legs, and preſſing principally on the toe; and upon examining their legs when ſtanding ſtill, if the paſterns (particularly long ones) appear perpendicular, and not oblique in their direction, or if the fetlock joint knuckles over, or in other words, bends forwards, little doubt may be entertained of their being unſound.

CHAPTER VI.

On WOUNDS.

THERE is no part of the modern practice of farriery in which the animal is more injudiciouſly treated, than in that which relates to wounds, and this appears the more extraordinary, when it is conſidered that this branch of the diſeaſes of the horſe is much more oſtenſible than thoſe which are internal, and conſequently leſs liable to uncertainty and miſconception. But it is here, as it is in every other caſe where the practitioner acts without poſſeſſing the rudiments of his art; for although he has the ſame remedies within his reach, yet he will rarely ſucceed in his application of them. Wounds which are incident to horſes, are generally unconnected with any ſpecific diſeaſe, except in the caſes of farcy and glanders, and upon this ground the mode of treatment muſt be plain and ſimple. It appears to have been a primordial proviſion of nature, to have endowed animals with the faculty of reparation of ſuch parts of their bodies as have been injured and diſorganized by accidental violence. This faculty is more perfect in brutes than in man, and exiſts in a different degree of perfection in different claſſes, in ſome, even to the power of complete regeneration of an amputated part, as in the lizard, the crab, and the polypus. In the practice of ſurgery, the catalogue of ſalves, ointments, &c. has been, of late years, very judiciouſly curtailed. Practitioners have diſcovered, that the common pretence of aſſiſting nature, has but too often proved the means of counteracting her endeavours. It is much to be lamented, that the ſame improvement has not extended to the veterinary art. In all recent injuries, the firſt proceſs which nature employs is an increaſed action in the part affected. For, as an injured part is rendered weaker, either by a loſs of tone or a loſs of ſubſtance, it is evident that a re-eſtabliſhment of its original organization cannot be effected without very conſiderable efforts in the ſyſtem. Hence inflammation almoſt always ſucceeds injury, in proportion, either with the extent of the miſchief, or its ſituation, or the greater or leſs irritability of the patient. In trifling accidents, the degree of inflammation is ſo ſmall as to require no attention; but in wounds of greater magnitude, or of parts moſt eſſential to life, the inflammation will be more ſerious, and will demand greater ſkill in the treatment. As, therefore, inflammation, to a certain degree, is the natural baſis of reſtoration, it remains to point out the proper mode of regulating it, ſo as to prevent the bad effects either of its exceſs, or of its want of ſufficient activity. In the firſt of theſe caſes, mortification will be the conſequence; in the laſt, calloſity and ſchirrus, or permanent diſorganization. Wounds may be divided into two claſſes, namely, ſimple and compound.

THE ſimple wound conſiſts of a diviſion of muſcular parts, either by laceration or a ſharp cutting inſtrument. The compound wound conſiſts of an affection of more than one part at the ſame time, viz. muſcle, tendon, ligament, and bone. In the ſimple wound, the firſt ſtep ſhould be to aſcertain the depth of it, and alſo to diſcover whether any extraneous ſubſtance is lodged within it.

THIS is particularly neceſſary in caſes where horſes have been ſtaked in leaping over hedges. If there is no extraneous body within it, and the muſcular parts alone are injured, or if any pieces of the ſtake are diſcovered, and carefully extracted, nothing more will be required than to bring the divided ſurfaces of the wound as cloſe together as poſſible, and to defend it from the air: nature will perform the reſt very ſpeedily. If, however, the patient is very fat and plethoric, and has not loſt much blood from the wound, bleeding will be neceſſary.

This is called union by the firſt intention, that is, without the neceſſity of matter being formed for that purpoſe. Here, therefore, it appears that nothing more is neceſſary than to regulate the inflammation. But the common practice in this caſe is to keep the ſurfaces of the wound apart from each other, by introducing a ſubſtance between them, ſuch as a candle, or a tent of tow dipped in ſome ſtrong ſtimulating mixture; and this is done with a view to the production of good matter. The miſchief ariſing from ſuch treatment muſt be obvious to every rational mind, for the firſt proceſs of nature, in this inſtance, will be an endeavour to get rid of the ſubſtance which is thus officiouſly interpoſed between the ſurfaces, and in this attempt the inflammation is carried to an exceſſive degree, very frequently to mortification. But even if the animal eſcapes this unfortunate criſis, nature becomes weary in making fruitleſs efforts, and the ſurfaces of the wound change their nature, and become callous and inactive, producing a diſeaſed abſceſs incapable of cicatrization. In this ſtate of the wound it is neceſſary to deſtroy the callous ſurface, either by the knife or by cauſtic, in which proceſſes the animal is put to great pain, and nature generally employs treble the time in performing by this artificial and miſapplied treatment, that which ſhe could have effected with eaſe and expedition, if left to her own uninterrupted operations.

THE COMPOUND WOUND

Requires, in ſome reſpects, a different treatment from that of the ſimple wound. For as the different parts which may be affected by the ſame injury (for inſtance, muſcle and bone) poſſeſs a different action in themſelves, it is neceſſary to aſſimilate them as much as poſſible to each other. Thus, when the bone is injured at the bottom of a wound, and inevitably expoſed to the air, a certain proceſs called exfoliation, muſt be carried on before it can be reſtored to health. This exfoliation is ſimply the operation whereby the living bone throws off the dead ſurface; but as bone is much more tedious in its efforts of reſtoration than muſcle, it follows that the muſcular parts will unite and heal long before the bone has completed its proceſs. In this caſe, that part of the bone which is detached becomes an extraneous body, producing new inflammation and a freſh abſceſs.

THIS, therefore, demonſtrates the neceſſity of allowing a ſufficient length of time for the bone to exfoliate, by preventing the muſcular parts from uniting over it, and in this caſe (and this only) tents are to be employed.

THESE may be dipped in common digeſtive ointment, and the ſurface of the wound ſhould be kept clean and defended from the air. In matters of this kind, which require ſkill and experience, the proprietor of a horſe would probably find it moſt to his intereſt to call in profeſſional aſſiſtance. As this branch of the veterinary art would require a much more extenſive detail than the object of the preſent work could embrace, and as it would alſo afford but little information to that claſs of my readers for whom it was principally intended, it will perhaps be ſufficient to have pointed out the common errors attending it, and thereby to ſhew the neceſſity of a more rational mode of practice.

CHAPTER VII.

On RESPIRATION.

RESPIRATION conſiſts in the inhalation and exhalation of atmoſpheric air into the lungs of man and quadrupeds, or analagous viſcera of other animals; part of the air is there abſorbed, and another part is exhaled, but is altered in its properties, only part returning in the ſtate of atmoſpheric air, and the remainder in the ſtate of fixed or carbonic acid air, and of phlogiſticated or azotic air, accompanied with a conſiderable quantity of moiſture. It is not neceſſary here to explain the uſes of reſpiration in the animal œconomy, that having been already done by ſeveral eminent phyſiologiſts, but to ſhew the peculiarities of the organs deſtined to that function in the horſe.

The poſterior part of the mouth or throat of the horſe is ſo conſtructed as almoſt entirely to prevent the return of air through its cavity, or, in other words, precludes expiration. Thus, although he can receive air through his mouth, he returns it only through his noſe. Hence the horſe always manifeſts great uneaſineſs when he is held by the noſtrils, as under thoſe circumſtances he naturally dreads ſuffocation.

From the poſterior part of the roof of the mouth a membrane deſcends, the extreme edge of which lies on the ſurface of the tongue. This membrane is called *Velum palati*, and one of its uſes is to prevent the food and water from returning through the noſe in their paſſage to the ſtomach. This membrane, in the human being, terminates in a deſcending point, termed the *Uvula*; but in the horſe it preſerves one regular form, on which account the animal has no uvula, the whole of the velum reaching down to the root of the tongue, and reſting upon it. Immediately behind the velum palati is ſituated a cartilaginous ſubſtance of a triangular pointed ſhape, having its baſe attached to the root of the tongue in the horſe, which is denominated the *Epiglottis*. Its office is to cover the orifice of the trachea or windpipe in the action of deglutition. The epiglottis is conſtantly elevated by its own elaſticity, and never covers the trachea, except at the moment when it is preſſed downwards by the food paſſing over it.

When it is elevated, it turns back with its upper ſurface immediately againſt and behind the velum palati, with which it enters into cloſe contact in ſuch a manner, that it forms a valve, preventing the return of air, or any ſubſtance whatever, through the mouth. *(Vide plate* 9, *letters* C *and* E.) Thus it may always be obſerved that the horſe, even during the moſt violent exertions, never opens his mouth for the purpoſe of breathing, but performs it ſolely through his noſe, on which account his noſtrils are wider in proportion than in other animals, which, when urged by exerciſe, or otherwiſe when requiring more air, open their mouths for its freer admiſſion.

The horſe has a peculiarity in the formation of his noſtrils which deſerves notice, each noſtril being divided by a ſeptum, on one ſide of which is the canal which communicates with the throat and lungs, on the other ſide of the ſeptum is a canal or ſac, which may be called the falſe noſtril, which reaches upwards about four or five inches, and is imperforate *(vide plate* 9, *letter* H); but for about two inches of that depth the ſeptum is ſlit up, and the edges of the ſlit are fringed with ſhort hairs; the particular uſe of this conformation has not yet been pointed out, and remains a problem for the phyſiologiſts. When the horſe inſpires, this part is filled with air, which remains ſtationary until the act of expiration, at which time it paſſes back again in conjunction with that which is returned from the lungs. The inflation of this cavity gives to the animal that animated appearance obſervable upon various occaſions.

In other reſpects, the organs of reſpiration differ but little from thoſe of the human being, except that the diaphragm is much more muſcular, and ſituated more obliquely, by which means the ſtomach lies below it, although the body is in an horizontal poſition. This inclination of the diaphragm renders the reſiſtance of the ſtomach and inteſtines leſs powerful than if it were placed in a more perpendicular direction. When the lungs collapſe, this diaphragm is ſlackened, but in the act of inſpiration it is tightened ſo as to force back the contents of the abdomen, by which means the capacity of the cheſt is enlarged. This is performed partly by its own muſcular contraction, and partly by the expanſion of the ribs, whereby the lateral points from whence the diaphragm takes its origin, are removed farther from each other.

This being the natural proceſs of reſpiration, it will not be difficult to conceive how much it muſt be impeded when the ſaddle is girthed extremely tight, or too far back towards the flank;

but this inconvenience does not end with the removal of the ſaddle, for the horſe is conſtantly girthed with a tight ſurcingle whilſt he is in the ſtable, with a view to keep up his belly. In either of theſe ſituations, reſpiration is carried on principally by the action of the diaphragm, as the intercoſtal muſcles cannot perform their office.

Old horſes are ſo ſenſible of this inconvenience, that, during the act of girthing, they ſwell out their cheſts as much as poſſible, by which means the girths become ſlack when the cheſt returns to its former dimenſions.

The horſe is more frequently attacked with inflammation of the lungs than any other quadruped. This may probably ariſe from the abuſes and irregularities which he is obliged to ſubmit to in his domeſticated ſtate, for by cloathing and the unnatural temperature of the ſtable, he is rendered much more ſuſceptible of cold than he would be under other circumſtances. When the attack is violent, the inflammation is frequently ſo great as to produce mortification in a few hours, and even if it is overcome by bleeding and medicine, it generally lays the foundation for a permanent cough or broken wind. This may be brought on by an effuſion of water in the cheſt, or by lymph being thrown out into the cells of the lungs, and poſſibly by a paralyſis of the diaphragm, or by the deſtruction of part of the lungs in conſequence of the inflammation. In any of theſe caſes reſpiration will be laborious, and the animal will become unfit for violent exertion. However, the moſt common appearance of the lungs in broken-winded horſes, is a general thickening of their ſubſtance, by which their elaſticity is, in a great meaſure, deſtroyed, and their weight ſpecifically increaſed, at the ſame time that their capacity for receiving air is diminiſhed. During life, the lungs entirely fill the cavity of the cheſt, ſo as to leave no ſpace between their outward ſurface and the inward ſurface of the ribs; thus they dilate and contract, following up by their own elaſticity the action of the ribs and diaphragm. Hence it is probable, that adheſions of the lungs to the ribs are not ſo injurious to reſpiration as might be imagined.

If the cheſt is punctured in the dead ſubject, the external air ruſhes in, and the lungs collapſe; but if the horſe was broken-winded, the lungs do not collapſe, which proves that they have loſt their elaſticity. This ſtate of the lungs ſufficiently accounts for the difficulty of reſpiration, for, as their faculty of dilatation is deſtroyed, the ribs cannot expand without forming a vacuum in the cheſt, which the preſſure of the external atmoſphere prevents, which may be readily perceived in the caſe of broken wind, for then the intercoſtal muſcles are ſo ſtrongly retracted, as to form a deep furrow between every rib, as well as a depreſſion in the flanks. On this account, air is received into the lungs with great difficulty, but its expulſion is not ſo difficult, as the return of the ribs and diaphragm naturally force it out by their preſſure. Thus, in broken-winded horſes, inſpiration is very ſlow, but expiration is ſudden and rapid, as may be ſeen by the flanks returning with a jerk. If there is water in the cheſt, the horſe never lies down, as the preſſure which would take place in that ſituation, would produce ſuffocation inſtantly.

THE foregoing are the general ſymptoms attendant on broken wind: it remains to inquire into the leſs violent affections of the lungs. The moſt frequent of theſe are manifeſted by coughs, which may be divided into the inflammatory and chronic kinds. In the inflammatory cough there is generally ſome diſcharge from the lungs, but in the confirmed chronic cough there is ſeldom any diſcharge whatever. As the horſe does not expectorate through his mouth, the mucus of the lungs is coughed up into the noſe, from whence it is afterwards diſcharged by the action of ſnorting or ſneezing. Hence, if a horſe ſnorts after he coughs, he is generally ſuppoſed to be (although the reaſon is not known) ſound in thoſe viſcera. In the human ſubject, aſthma is commonly divided into two kinds, the humoral and the ſpaſmodic. Veterinary practice has not hitherto furniſhed any proofs, that the horſe is ſubject to aſthma of the ſpaſmodic kind; and from what may be collected from the ſymptoms of broken wind, it is probable that the latter diſeaſe in horſes is totally different from the aſthma in the human being. For the attacks of aſthma are uſually periodical, whereas the effects of broken wind are conſtant, though not always equal, their violence being increaſed by exerciſe, which naturally demands more frequent and more copious reſpiration, as well as by ſome other cauſe. Diſſections of the dead ſubject afford little or no proof of the nature or exiſtence of nervous complaints, hence it is not poſſible to aſcertain whether a paralyſis of the diaphragm may conſtitute one cauſe of broken wind. We muſt therefore recur to ſuch cauſes as admit of ocular demonſtration, and, of theſe, none are ſo diſtinct as the general thickening of the ſubſtance of the lungs, juſt mentioned.

WITH regard to water in the cheſt, it is frequently problematical, on examination of the dead ſubject, whether the extravaſation took place before or after death.

ANOTHER imperfection which may be included in the claſs of diſeaſed reſpiration, is the ſound which ariſes in breathing, with ſome horſes, when their pace is accelerated. A horſe of this deſcription is termed a *Roarer*. From my own obſervation, I have not been able to diſcover whether its ſource is in the lungs, the trachea, or the noſe, though it is probable its ſeat is in the trachea or larynx. Dealers have a method of aſcertaining the exiſtence of the diſeaſe by ſtriking the horſe under the belly with a whip, and turning him ſuddenly round at the ſame time. If he groans during this proceſs, they ſay it proves that he is a roarer. This is probably occaſioned by the ſudden contraction of the abdominal muſcles forcing air from the lungs through the trachea with greater rapidity, in conſequence of the pain he feels from the ſtroke of the whip, as well as from the bending of the ribs in the action of turning round in a ſmall compaſs. This diſeaſe prevails to a different degree in different ſubjects; in its commencement it is generally manifeſted by a whiſtling noiſe, but in the confirmed ſtate it is more ſonorous, and reſembles deep groaning. In either caſe it has hitherto remained incurable.

The orifice of the trachea is frequently injured by the cuſtom of pinching it with the hand, to diſcover, by the manner of coughing, whether or not a horſe is ſound in his wind. A caſe of this kind occurred during my reſidence at the veterinary college. A horſe was brought to the infirmary which was afflicted with an exceſſive difficulty of breathing, accompanied with great noiſe from the noſtrils, and a copious diſcharge of ſaliva from the mouth. As the horſe eat and drank as uſual, and in all other reſpects was in perfect health, it was ſuſpected that the laborious reſpiration aroſe from ſome obſtruction about the larynx, or at the entrance into the naſal cavities. In order to give immediate relief, Mr. St. Bel, who was at that time profeſſor, performed the operation of bronchotomy, or, in other words, made an opening into the windpipe about four inches from the lower jaw. Into this opening a leaden tube was introduced, which was kept in its ſituation by a ligature round the neck. The animal was inſtantly relieved, and reſpiration was carried on entirely through this hole in the trachea. The tube was removed and cleaned every day, and the horſe appeared perfectly eaſy in every reſpect for nearly three weeks, until the ligature happening to get looſe in the night, the tube dropped out, and he was ſuffocated. On diſſection, it appeared that the membrane lining the mouth of the windpipe was ſo thickened, as to have entirely filled up the cavity, and thereby prevented the air from paſſing and repaſſing freely.

As free reſpiration is the baſis of health and vigour, ſo will the contrary produce general debility. Thus, the digeſtive powers of the ſtomach being weaker in horſes that are broken-winded, flatulency is produced, and the air which is generated in the inteſtines makes its eſcape backwards whenever the animal coughs. This circumſtance probably gave birth to the ridiculous cuſtom of making an artificial and ſupplementary anus, with a view of facilitating the egreſs of the wind, which was erroneouſly ſuppoſed to be the cauſe of the diſeaſe. Broken-winded horſes are commonly much better at graſs than in the ſtable. This ariſes from their being ſurrounded with a more ſalubrious atmoſphere, and from the green food being more eaſy of digeſtion than hay and corn. On this account carrots are given to horſes of this deſcription with advantage.

Some horſes acquire a habit of biting their manger, accompanied with a convulſive motion of the windpipe; in the language of the ſtable, they are diſtinguiſhed by the name of *Crib-biters.*

During this action, it is ſuppoſed that they ſuck air into the ſtomach; but ſeveral reaſons may be adduced to prove that this is not the fact.

HORSES which are addicted to this habit, generally perform it whilſt they are maſticating their food.

DURING the convulſion there is a great loſs of ſaliva, which eſcapes whilſt the mouth is open and fixed upon the edge of the manger. As the ſaliva is a very eſſential agent in digeſtion, it will be reaſonable to conclude that the loſs of it muſt be prejudicial to the animal, inaſmuch as the digeſtive powers of the ſtomach will be inſufficient for their proper functions. From this cauſe, therefore, enſues the flatulence, or collection of wind in the ſtomach and inteſtines of horſes of this deſcription. Again, that the wind is not drawn into the ſtomach through the mouth and œſophagus, may be proved by the mechaniſm of the organs of reſpiration, which have been deſcribed. If the animal ſucked in air during the action of crib-biting, it muſt neceſſarily enter the lungs, as the orifice of the windpipe is always open, except at the moment of deglutition, and air cannot be ſucked inwards without a cavity being formed for its reception, as is the caſe in inſpiration. The only way in which air could enter the ſtomach would be by the action of ſwallowing; but air could not be ſwallowed whilſt the mouth was open. This diſeaſe, therefore, ſeems to conſiſt in a ſpaſmodic affection of the œſophagus and trachea, excited by ſome ſympathy with the muſcles of the jaws. But from whatever cauſe the habit of crib-biting may ariſe, it is always deemed incurable.

It is cuſtomary, however, to buckle a ſtrap round the upper part of the neck, in order to prevent the movement of the windpipe. A horſe ſubject to this complaint decreaſes much in value, as he is generally lean and emaciated, and therefore incapable of performing much labour. He alſo wears out his teeth, whereby he is prevented from grazing properly.

It is a prevailing opinion amongſt grooms, that a horſe's wind may be affected by giving him too much water, and under this impreſſion they would (if poſſible) deprive him of it entirely.

It certainly is not prudent to permit the animal to drink very copiouſly immediately before he is put into motion, as the increaſed dimenſions of the ſtomach would confine his powers of reſpiration. But this furniſhes no reaſon why he ſhould not be allowed a ſufficient quantity at proper periods. The food which he takes in the ſtable is perfectly dry, and very different from what he would eat in a ſtate of nature, conſequently he will require more fluids for the purpoſes of digeſtion. The great conſumption of perſpirable fluid which the horſe experiences during exerciſe, alſo renders a proper ſupply of water abſolutely neceſſary. The imperfect digeſtion in horſes that are thick-winded, produces fermentation and an unnatural heat in the ſtomach, on which account horſes of this deſcription are more eager for water, and that in proportion to the privation of it.

It is cuſtomary to water them twice daily, viz. in the morning and in the evening; the quantity, a pailful at each time. But it would be much more beneficial to give them half a pailful at four times, inſtead of double that quantity at twice.

CHAPTER VIII.

On the Structure and Œconomy of the STABLE.

SINCE it has been found neceſſary to domeſticate the horſe, in order to appropriate him more immediately to our ſervice, it ſurely becomes not only incumbent on humanity, but eſſential to private intereſt, to employ ſuch modes of treatment as are moſt likely to contribute to his health and comfort. With this view it ſhould firſt be conſidered, that, in this ſtate of ſubjugation, the animal experiences a total change in his natural habits, not only with regard to his lodging, but alſo to the quality of his food.

UNDER theſe circumſtances, it will not be ſurpriſing that he ſhould be expoſed to many diſeaſes, to which, in a ſtate of nature, he would not be ſubject.

The extraordinary exertions which are frequently required of him, from caſes either of neceſſity or amuſement, are ſuch as he could not endure, if he were not prepared by daily exerciſe and the moſt nouriſhing diet. But the majority of the world uſe him as a machine, the powers of which they conceive to be inexhauſtible, and hence ariſe ſuch ſhameful abuſes of one of the beſt animals in the brute creation. Nothing can be a greater reproach to mankind than the appearance of a poſt-horſe. This miſerable and patient creature ſhews how far our feelings can be blunted by cuſtom. The wretched animal is ſeldom reduced to the condition of a poſt-horſe, until ſome bodily imperfection has rendered him unfit for the purpoſes of parade or amuſement. In this ſituation he is conſigned, by his mercileſs owner, for a paltry conſideration, to perform double labour, with the loſs of half his original ability, until at length nature, overcome by continued injuries, ſinks under the burthen, and he is converted into food for his late aſſociates the dogs.

This termination of miſery is accelerated as much by improper management, as it is by exceſſive fatigue. But cuſtom, the tyrant of ordinary minds, has ſanctioned numerous rules in the œconomy of the ſtable, which a moment's reflection would be ſufficient to explode. Great obſtacles to a thorough reformation in this reſpect, will always ariſe from the obſtinacy and ignorance of thoſe to whoſe care the animal is entruſted. It therefore behoves the proprietor to exert his authority, by enforcing obedience to ſuch maxims as his own better judgment muſt naturally dictate, and this will be beſt effected by viſiting the ſtable at uncertain periods, whereby improper practices will be more liable to detection.

In deſcribing the particulars moſt neceſſary to be attended to in this important branch of the preſent ſubject, it will be expedient to begin with the ſtructure of the ſtable. The principal errors in this department conſiſt, generally, in the want of ventilation, deficiency of light, narrowneſs of the ſtalls, and the declivity of their pavement.

VENTILATION is of the greateſt importance, inaſmuch as the health of the animal is moſt materially connected with it. The impoſſibility of excluding air from ſpace (except by exhauſtion) is a fortunate circumſtance for the horſe, as it fruſtrates, in ſome degree, the attempts which are conſtantly practiſed to prevent its entrance into the ſtable, even by ſtopping the key-hole of the door. This cuſtom originates among grooms, from the motive of giving to the animal the ſame appearance in his coat in winter, as it generally puts on in ſummer.

SUCH a perverſion of the laws of nature is productive of certain bad conſequences, which the following obſervations will tend to demonſtrate.

For this purpoſe, it will firſt be requiſite to deſcribe the ſource from whence animal heat is produced, and maintained in a degree ſufficient for the ſupport of life. This ſource is atmoſpherical air, and the mode whereby it is applied to the vital organs of animal bodies is by reſpiration. A certain part of this air combines with the blood in the lungs, and by ſome chemical action, not yet thoroughly underſtood, furniſhes heat to the whole frame. But, as in this climate the heat of the animal is greater than that of the air by which he is ſurrounded, it follows, from the known laws of heated bodies, that there is a conſtant emiſſion of heat from the horſe, which is abſorbed by and warms the cooler air with which he is in contact. Along with the heat, a quantity of moiſture conſtantly eſcapes from the pores of the ſkin, which, when the animal is at reſt, and not kept too cloſe, is inſenſible to our organs; but when he is put into violent motion, or kept too hot, it becomes ſenſible in the form of ſweat, or of ſteams iſſuing from his ſkin.

The ſenſible perſpiration is greatly augmented whenever the air ſurrounding him is not changed ſufficiently quickly to enable it to abſorb the moiſture as it is perſpired, therefore when the horſe goes with the wind, he ſweats more than when he goes againſt it, becauſe, in the firſt inſtance, he is conſtantly ſurrounded by the vapour which flies off from the ſurface of his body, whereas, in the latter caſe, the wind, meeting him, drives it behind him.

Beasts of chace appear, either from inſtinct or ſome other cauſe, to be ſenſible of this difference, for they almoſt invariably run with the wind, whereby they, in a great meaſure, carry their ſcent with them; they are alſo, by this means, better enabled to hear the cry of their purſuers. The alternate action of the production of heat by the combination of air with the blood in the lungs and arteries, and the throwing it out from the body by perſpiration, is carried on without intermiſſion during health.

FROM what has been ſaid, it appears that the heat thus produced by the animal is expended upon heating the air which comes in contact with him; whence ariſes that ſpecies of warmth which is generally met with in a cloſe or confined ſtable, and upon this ground very erroneous concluſions have been formed; for it is generally ſuppoſed that this artificial temperature increaſes the warmth of the animal, and meaſures are conſequently adopted to ſupport it, by excluding the external air as much as poſſible. Flannel applied to the ſkin prevents animal heat from evaporating ſo quickly as it does when the body is expoſed without covering, and thus the ſurface of the body will be conſiderably warmer. Yet the warmth does not exiſt in the flannel, but in the body which it covers; for the temperatures of ice, and metals when cold, are not increaſed by being enveloped in flannel, although heated bodies thereby retain their heat much longer; but theſe ultimately become cold, unleſs the original generating cauſe of heat is continued to be applied. In the ſame manner, therefore, the heat which flies off from the body of the horſe when in a cloſe ſtable, certainly renders the atmoſphere of the ſtable warmer than that which is without; but this heat will not continue to be generated in a proper degree, unleſs the lungs are plentifully ſupplied with freſh air, unpolluted by the breath and perſpiration of the animal, and the fumes ariſing from his excrements. On this account, cloſe ſtables do not increaſe the *internal* heat of the horſe, but rather have a tendency to diminiſh it, by rendering the circulation of the blood languid, for want of a ſufficient quantity of the natural ſtimulus of that portion of the atmoſphere called oxygen or vital air. The confined vapour alſo becomes condenſed on the walls, racks, and mangers, producing a conſtant and unhealthy dampneſs. As the horſe, when in the ſtall, is ſtationed to one ſpot, and conſequently cannot warm himſelf by exerciſe, it therefore is not improper to clothe him moderately; but, at the ſame time, he ſhould breathe freſh air; for which purpoſe nothing is required but an outlet for the foul air, by which means a proper circulation of that fluid will be maintained. This may be effected by carrying a tube of ſix inches diameter from the center of the cieling through the roof. The next circumſtance to be attended to, is the admiſſion of a ſufficient portion of light. It is the prevailing cuſtom to have ſmall windows to ſtables, and frequently none whatever. The vigorous and full enjoyment of animal faculties, depends conſiderably on their being ſufficiently exerciſed; hence the ſtimulus of light is neceſſary to ſtrengthen the eye, and to render it capable of perfect viſion. But when the animal is ſhut up in an obſcure ſituation, probably during the greateſt part of the day, it muſt neceſſarily follow that the function of ſight will be proportionably impaired, which is manifeſt by his winking his eyelids, from being unable to bear a ſudden increaſe of light on being led out of the ſtable. It is uſual to leſſen the darkneſs of ſtables by whitewaſhing the walls; but this intention would be better effected by enlarging the windows. The influence of light upon vegetable and animal bodies has been aſcertained by experiment, and it appears that, when deprived of it, they are neither ſo perfect in their colours, nor ſo vigorous in their conſtitutions. Birds of the northern regions are not ſo brilliant in their plumage as thoſe of the ſouth. It is alſo a remarkable fact, that blind horſes are ſeldom ſo fine and gloſſy in their coats as other horſes. What analogy this laſt circumſtance may bear with the foregoing, I ſhall not pretend to determine.

Narrow ſtalls are a ſource of great inconvenience and danger to the animal when he turns round in them. In the courſe of my practice, I have met with ſeveral caſes of diſeaſed ſpines or back bones from this cauſe only. Injuries of this nature are generally beyond relief, on which account they point out very forcibly the neceſſity of prevention.

When the horſe is required to turn round in a narrow ſtall, his own experience of his ſituation would teach him to move backwards out of it, but the groom prevents him from ſo doing, by ſtanding cloſe behind him, and urging him, either by a threatening tone of voice or the whip, to turn inſtantaneouſly in a ſpace conſiderably ſhorter than his own body.

ALTHOUGH by exerting the utmoſt flexibility of his frame, the animal may, perhaps, perform this motion daily without injury, he is nevertheleſs conſtantly expoſed to an accident which may, in an inſtant, render him for the future totally unſerviceable.

THE width of the ſtall, therefore, ſhould be at leaſt ſix feet, the length, nine feet. This will enable the horſe to ſtretch out his limbs when he is lying down, which is a great relief to him when fatigued.

THE manner in which the ſtall is uſually paved, is equally productive of bad effects. The ſurface is generally formed with a deſcent from the head of the ſtall backwards, with a view to let the urine run off from the litter. Thus the horſe ſtands conſtantly up hill, by which poſition he naturally becomes ſo much fatigued, that he may be ſaid to have performed half his work before he is led out of the ſtable. For the ligaments of his joints, and the flexor muſcles of his legs, are thereby perpetually extended. If the reader will ſtand, for a few minutes, with his toes higher than his heels, the pain he will feel in the calves of his legs will ſoon convince him of the truth of this remark. Hence, when the horſe is not eating, he always endeavours to find his level, either by ſtanding acroſs the ſtall, or elſe as far back as his halter will permit, ſo that his hind legs may meet the aſcent of the other ſide of the channel. But the greateſt miſchiefs which ariſe from this mode of conſtructing the pavement, conſiſt in obliging the horſe to ſtand with his fore legs farther under him, and out of a perpendicular direction, by which poſition he not only acquires a bad habit of leaning forwards, but alſo becomes liable to a contraction in the heels of his feet, by the weight being thrown principally on the toes. It moreover promotes an inclination to ſwelling in the hind legs, as well as being frequently the cauſe of his body ſlipping backwards in the ſtall when he lies down, ſo that being at the utmoſt extent of his halter, he has not the power of riſing again on his legs, for want of the free uſe of his head and neck.

THE ground ſurface of the ſtall, therefore, ſhould be perfectly level, and paved with hard bricks. A conductor for the urine may be obtained by means of a drain paſſing from the center backwards under the pavement. For this purpoſe the center of the ſtall ſhould ſink ſomewhat lower than the other parts of it, and the entrance to the drain ſhould be covered with an iron grate, about ſix inches ſquare.

IT will be advantageous to conſtruct the manger in ſuch a manner that it may be removed by ſliding into the wall, ſo that when the horſe has eaten his corn, he may have nothing to bite at when the groom is cleaning him, from which habit horſes ſometimes become crib-biters.

The racks ſhould be compoſed of caſt iron, as wooden rack ſtaves frequently introduce ſplinters into the lips during the action of gathering the hay.

The door of the ſtable ſhould be at leaſt ſeven feet in height, which will render the horſe leſs liable to ſtrike his head againſt the upper part of it in paſſing through it.

As the foregoing are the principal points to be attended to in the ſtructure of the ſtable, it will be proper, in the next place, to enquire into its œconomy, under which head may be included diet and cleaning. In the cuſtomary mode of regulating the diet of the horſe, there are many evident improprieties; but previous to an expoſition of this ſubject, it will be neceſſary to treat of his organs of digeſtion. Although he is a quadruped of the herbiferous tribe, he does not chew the cud, as ſuch an operation would have been very inconvenient to him in performing the offices for which he was intended by nature.

His ſtomach, therefore, is ſmaller than that of the ox. But to make up the deficiency in the quantity received at one time, he is obliged to eat more frequently; and although his digeſtion is not ſo perfect as it is in animals which ruminate, yet it is much more rapid, ſo that the horſe fills his ſtomach twice as often as the ox.

Nature has for this purpoſe furniſhed his ſtomach with the faculty of ſecreting the gaſtric juice in very large quantities; ſhe has alſo endowed it with very ſtrong muſcles, to enable it to force its contents in a leſs digeſted form into the inteſtines; for, on examining the duodenum, the food will be found to have undergone very little alteration in its appearance, from which it is probable that the ſtomach of the horſe contributes little more towards digeſtion than combining the gaſtric juice with its contents, and immediately forcing them into the inteſtines, which, in this animal, are exceedingly large, particularly the cœcum, the ſtrong muſcular bands of which render it, probably, an additional ſeat of digeſtion.

THE cœcum, or blind gut, occupies the lower part of the abdomen, and terminates in a point called its appendix. This terminating point is ſometimes filled with ſtones of an extraordinary magnitude. Specimens of this kind have been found of eight inches diameter. They are, probably, concretions of the earthy particles received with the food, which, by their gravity, precipitate during digeſtion, and take up their abode in the moſt depending part of the inteſtines. Whilſt they remain ſtationary, they occaſion but little inconvenience to the animal; but if they happen to be ſhifted towards the mouth of the gut, the conſequences are generally fatal.

FROM the ſize and direction of the muſcles of the ſtomach of the horſe, ſome anatomiſts have been induced to attribute to it the action of trituration; but this opinion is eaſily controverted by taking it in a mechanical point of view, for to be capable of triturating its contents, it appears neceſſary that it ſhould poſſeſs the faculty of re-action, either in a lateral or a rotatory direction, and both of theſe are completely prevented by the preſſure of the abdominal muſcles and other ſurrounding parts, ſo that the only action which it poſſeſſes, is ſimply that of compreſſion.

THE fibres of the muſcles which perform this action, are wrapped round the cardiac or receiving orifice of the ſtomach in a tranſverſe direction, by which means they act as a ſphincter, and effectually cloſe it, ſo as to prevent regurgitation, or the return of its contents. *Vide plate* 10, *fig.* 1---*fig.* 2 ſhews the circular muſcles of the œſophagus or gullet.

THIS prevention from vomiting appears to be a neceſſary ordination; for if the horſe regurgitated, the food which returned muſt paſs outwards through his noſtrils, as the peculiar formation of the poſterior part of his mouth would not permit it to go through that channel.

THE horſe has no gall bladder*; but to counterbalance this privation, the gall duct is proportionably larger. As the horſe has not always the opportunity of eating at his pleaſure, like thoſe animals which graze in a ſtate of nature, it frequently occurs, that, after a long faſting, he eats ſo voraciouſly as to overload his ſtomach. On this account, it is neceſſary to regulate the quantity of food to be given to him at one time. But, in ſtables, where horſes ſtand together without any partition between them, this rule cannot be attended to, for the moſt greedy horſe generally eats his own ſhare and part of his neighbour's, and as greater expedition is required to do this, he of courſe ſwallows it without ſufficient maſtication, in which caſe it cannot be ſo eaſy of digeſtion. When the ſtomach is thus præternaturally diſtended, its functions are greatly impeded, if not totally ſuſpended, and from the great ſympathy between the ſtomach and the brain, a degree of apoplexy is produced, terminating in delirium and death. In the language of farriery, this diſeaſe is denominated the ſtaggers, and the foregoing is moſt probably its true ſource. At the ſame time a jaundice, or a circulation of the bile through the blood veſſels, takes place, and it is poſſible that this ariſes alſo from the preſſure of the ſtomach againſt the hepatic veſſels preventing the bile from flowing into the duodenum. Thus it will be found that the jaundice almoſt always accompanies the ſtaggers.

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* A celebrated Treatiſe upon Farriery by Mr. Taplin, has paſſed through eleven editions, with a chapter on the diſeaſes of the gall bladder!!!

Waggon, ſtage, and poſt-horſes are moſt ſubject to the ſtaggers, and, on this account, the diſeaſe is ſuppoſed to be infectious, as it frequently carries off ſeveral in the ſame ſtable. But as horſes of the above deſcription ſtand together without any partition, it will not be irrational to conclude that the diſeaſe ariſes from the cauſe before-mentioned. For in every caſe where I have had opportunities of examining horſes which have died of the ſtaggers, I have uniformly found the ſtomach diſtended with a large quantity of dry undigeſted food. But as it may appear extraordinary that this ſhould occur to many horſes in the ſame ſtable, it will be neceſſary to aſſign ſome additional data to ſtrengthen this theory. The following are the moſt prominent: If a carrier, or a proprietor of poſt-horſes, loſes a horſe in this way, it muſt follow, that if he is not immediately replaced by another horſe, the reſt muſt have their labour proportionably increaſed. Hence debility follows increaſed fatigue, the digeſtion becomes weakened, and the remainder may die ſucceſſively in the ſame manner, without any infection whatever. It alſo frequently happens, that if one horſe in a ſtable dies of the ſtaggers, the ſame diſeaſe is attributed to all the reſt which die at the ſame time, although their deaths might have been occaſioned by a very different diſorder. Therefore proprietors of waggons and ſtage coaches generally experience the greateſt loſſes when the roads are bad, and the labour much increaſed.

As the foregoing evils are in a great meaſure the reſult of a want of regulation in the diet of the animal, it remains to point out the plan neceſſary to be purſued in this reſpect. The common practice is to feed all horſes in the ſame proportion, without regard either to the labour they perform, or to their ages and conſtitutions. The impropriety of this practice muſt be ſufficiently evident, and it is, without doubt, the baſis of many diſeaſes. In regulating the proportions to be given to different horſes, much judgment is not required. The following hints may probably ſuffice. For a ſaddle or coach-horſe, which, on the average, goes about ten miles daily (and there are ſome thouſands which do not perform even ſo much) half a peck of ſound oats, with eighteen pounds of good hay, will be quite ſufficient. If the hay is not good, another quarter of a peck of oats may be added. Upon this ratio, therefore, horſes which work very hard ſhould have a larger allowance, viz. from one peck to three half pecks of oats, and twenty pounds of hay daily.

The conſumption of grain by horſes in this kingdom is aſtoniſhing, and the preſent alarming ſtate of the country, with regard to proviſions, calls aloud for the utmoſt œconomy in this department.

They who keep idle horſes in a pampered ſtate, would do well to conſider how much, in this inſtance, they ſacrifice the comforts of the poor, to the vanity and prejudices of worthleſs grooms.

The food moſt generally made uſe of conſiſts of hay, clover, oats, beans, and wheaten bran.

Barley and buck-wheat are ſometimes given. Barley is undoubtedly a wholeſome food for horſes, but it is ſeldom employed as ſuch, except it has been damaged by weather, and rendered unfit for malting. In this ſtate, its wholeſomeneſs becomes very queſtionable. Grain of every deſcription may be much eaſier and more perfectly digeſted by being firſt bruiſed in a mill. Cut ſtraw helps to fill the ſtomach; much nutriment, however, is not to be expected from it; but it has the good effect of obliging the horſe to chew his corn better before he can ſwallow it. In the ſpring of the year, vetches and young clover are given to horſes whoſe employments prevent them from being turned to graſs; but theſe ſhould be uſed very moderately, as fatal conſequences ſometimes ariſe from their fermentation in the ſtomach, and the rarefaction of the air contained in them. Carrots conſtitute a very grateful and nutritious diet, and are particularly beneficial to thick-winded horſes.

WITH regard to water, horſes generally prefer that which is ſoft, and even thick and muddy. Soft water ſhould therefore always be given to them, if poſſible. The quantity ſhould be proportioned to the labour which the animal undergoes, for if he ſweats much, he will conſequently require more to repair the conſumption of the fluids of his body. It is cuſtomary in hunting ſtables to warm the water before the horſe drinks it; this is a very bad practice, as it renders him liable to be griped whenever he drinks it in any other ſtate. It certainly is not prudent to give much cold water to a horſe when he is heated by exerciſe, but other periods may be found when he may drink it with ſafety. Grooms have a fooliſh habit of galloping horſes immediately after drinking, with the intention of warming the water in their ſtomachs. By theſe unneceſſary precautions, it would appear that cold water was both unnatural and prejudicial to the animal; but it can only become ſo from his being rendered irritable and tender by the abſurd modes with which he is treated in his domeſticated ſtate. In addition to theſe remarks, it will not be irrelevant to ſay ſomething on the manner in which hunters and racers are generally trained for their reſpective employments. This is termed getting them into condition.

The means reſorted to for this purpoſe are purging and exerciſe, both of which, when regulated with judgment, are certainly proper preparatives; but as horſes differ much in their conſtitutions, it muſt be obvious that the ſame mode of treatment cannot be adapted for all indiſcriminately; and a want of attention to this circumſtance is the cauſe why it does not always ſucceed.

Whenever the validity of long eſtabliſhed maxims is queſtioned, the ſupporters of thoſe maxims conſtantly urge their experience in their defence of them; but men who have purſued but one path, cannot be ſaid to poſſeſs an extenſive experience. Their knowledge of a ſubject will be confined in proportion with the narrow ſcale of their experiments. Hence many fallacious proceſſes are perſiſted in, merely becauſe the parties have neither the inclination to change them, nor the perſeverance to give new ones a fair trial.

THE object in training hunters and racers, appears to conſiſt in an attempt to increaſe their powers of reſpiration, and to enable them to ſupport violent exertion for a long duration. The firſt proceeding, therefore, is to diveſt them of all ſuperfluous animal matter. This might be accompliſhed by exerciſe only; but as a more expeditious mode is ſometimes required, purges are adminiſtered, which increaſe the abſorption of the fluids, and carry them off by the inteſtines.

WHEN the horſe has been thoroughly purged, and recovered from the debility which generally enſues (for the doſes are ſo ſtrong, that it is no uncommon event for a horſe to die under their operation) his exerciſe commences, or, in the language of the turf, he takes his ſweats.

By this means his reſpiration is improved, and his muſcular powers are increaſed. But the exerciſe which he receives out of doors is not deemed ſufficient for this purpoſe, he is therefore cloathed from head to foot with a hood and two or three cloths, and the ſtable, at the ſame time, is kept as hot as poſſible by every attempt to exclude the external air. Notwithſtanding this proceſs reduces the weight of the horſe, yet the debility which it muſt inevitably create, counterbalances, in a great meaſure, the advantages which are ſuppoſed to be derived from it. When the ſweating which is excited by galloping is carried to an extreme, the muſcles are ſo much exhauſted of their interſtitial fat and fluids, as to become extremely rigid, and, in ſome meaſure, inelaſtic, in which ſtate the animal does not acquire a perfect uſe of them until the circulation of the blood has been increaſed by motion. This, therefore, ſhews that a horſe may be galloped off his ſpeed, or, in other words, become ſlower in his pace the longer he is trained. It is uſual to put race-horſes on the muzzle for ſeveral hours before they run a race, to prevent them from filling their ſtomachs. It would certainly be improper to ſtart a horſe with a full belly; but, on the other hand, great debility muſt be produced from obliging him to faſt for an unreaſonable length of time. The ſame plan is purſued with hunters on the hunting days, particularly with regard to the allowance of water. But when it is recollected that a hunter ſets out in the morning with nearly an empty ſtomach, and is frequently ridden for ſeven or eight hours without baiting, it cannot be rational to ſuppoſe that he can be ſo capable of going through exceſſive fatigue, as if he had previouſly received a quantity of food ſufficient for the demands of nature.

Whatever food and water a hunter might take on the hunting morning (provided he was fed early) would undergo the digeſtive proceſs, and be ſo diſpoſed of by the time he reached the cover, as to occaſion no inconvenience whatever. Thus, when the animal has been obliged to faſt for an unreaſonable length of time, and has alſo undergone exceſſive fatigue, the ſtomach loſes its tone, and the appetite does not return until the following morning. As a remedy for this inconvenience, grooms give cordial balls, ſo that in proceſs of time, the horſe experiences the ſame effects which take place in mankind when accuſtomed to drink drams, and becomes, in a great meaſure, unſerviceable, if he does not receive this artificial ſtimulus.

NEXT to proper feeding, good cleaning is of the utmoſt importance. The method of performing this part of the duties of the ſtable is ſo familiar to every one, that it will not be neceſſary to deſcribe it.

IT ſhould, however, be remembered, that as the horſe ſheds his coat in the ſpring and autumn, it is not proper to uſe a curry-comb at thoſe periods, for fear of forcing off the hair too rapidly, and expoſing him to catch cold. Hand-rubbing the legs is a very beneficial practice. Horſes, after hard riding, are apt to break out again into a ſweat in the ſtable, after they have been thoroughly cleaned and dried. This happens principally in hot ſtables, for the veſſels of the ſkin having been greatly diſtended and relaxed in the act of throwing out the perſpirable matter, do not again readily recover their tone and contractile power, on this account the heat of the ſtable is alone ſufficient to bring on a freſh perſpiration. Horſes, therefore, after hard exerciſe, ſhould be cleaned and dreſſed in a moderately cool ſituation. Cleanlineſs in the litter and pavement of the ſtall, is alſo conducive to the health of the animal. The dung, if ſuffered to remain in one ſpot for any length of time, generates volatile alkali in ſuch a degree as to produce great irritation both on the eyes and lungs. Neither hay nor corn ſhould be kept in the ſtable, nor in any ſituation within reach of its effluvia. The racks and mangers ſhould be frequently ſcraped and waſhed.

The padding of the ſaddles ſhould be expoſed to the ſun, or the heat of the fire, after being uſed.

Bits ſhould be kept clean, and wiped well before they are put into the horſe's mouth, as he has a natural averſion to any thing greaſy. Innkeepers and coach-maſters would find it their intereſt to prevent the abominable cuſtom of waſhing horſes over their whole bodies with cold water immediately after having gone a ſtage. That they ſurvive it, is no proof of its utility, but only ſerves to ſhow the power which nature has of reſiſting the effects of any treatment which is hoſtile to her œconomy. If the animal was put into motion immediately after this operation, it might be leſs prejudicial; but when he is tied up in a ſtable in that ſtate for two or three hours, and left to dry by evaporation only, it cannot be difficult to perceive the impropriety and danger of ſuch a practice. The legs of horſes of all deſcriptions ſhould never be waſhed without being afterwards rubbed dry. The feet ſhould be picked very clean after exerciſe, and, if hard and dry, ſhould be ſtopped with clay, or any other ſubſtance which will retain moiſture. During the day time, if the horſe does not work hard, the litter ſhould be removed entirely from under him, ſo that he may ſtand on the bare pavement, which method is very beneficial to his legs and feet. It is common to lay a little ſtraw in the ſtall, under the horſe's belly, upon entering the ſtable, to induce him to ſtale; but this is not a good practice, for the animal functions become ſo much controlled by this aſſociation of two different actions, as to be incapable of performing their office without ſuch an artificial ſtimulus.

WHISTLING alone is ſufficient for this purpoſe. In this place it will not be improper to point out the bad conſequences of forcing a horſe to travel, for a great length of time, without permitting him to void his urine, for by being thus obliged to retain it, the ſphincter of the neck of the bladder acquires the habit of contracting ſo ſtrongly, as to become inſenſible to the natural ſtimulus of the accumulation of the fluid contained within it. From this cauſe, there are but few old horſes which are not afflicted, more or leſs, with ſtrangury.

CHAPTER IX.

On the AGE of the HORSE.

QUADRUPEDS generally furniſh ſome viſible mark, whereby their age may be aſcertained with tolerable certainty. Thus, the ox acquires annually an additional ring on his horns; the buck, an additional branch to the palm.

IN the horſe it is manifeſted by an alteration in the appearance of the teeth, and certain parts of the mouth. The horſe poſſeſſes forty teeth, viz. twelve front teeth, or inciſores, or nippers, twenty-four molares or grinders, and four canine teeth, which are called tuſhes; theſe laſt are wanting in the mare, except in ſome very few inſtances. Until five years old, the age of the horſe is aſcertained by the ſucceſſive ſhedding of the twelve front teeth or inciſores, which proceſs begins at two years and a half old, and is carried on in the following order, namely, from two years and a half until three, he ſheds the two middle teeth of the lower jaw, and alſo of the upper jaw*. *Vide pl.* 12, *fig.* B. From three years and a half until four, he ſheds the two next in both jaws. *Vide fig.* C. From four and a half until five, he ſheds the two corner teeth of both jaws; and, at the ſame time, the canine teeth or tuſhes make their appearance. *Vide fig.* D. He is then no longer called a colt. At the upper ſurface or top of every tooth, there is a ſmall black cavity reſembling the eye of a bean. This cavity in the teeth of the lower jaw furniſhes the age from five years until ſeven; after which period it is uſual to pronounce the horſe to be aged, and deprived of any ſigns whereby his age can be aſcertained. Neverthelеſs, the age may be calculated until twelve years by the ſame marks in the upper jaw, which remain after thoſe in the lower jaw are worn out. This will be explained in its proper place. At five years old, the black marks or cavities in the two middle teeth of the lower jaw are filled up, and nearly diſappear; for as they are ſhed the firſt, ſo do they loſe their marks before any of the reſt. *Vide fig.* E. At ſix years old, the black marks of the two ſecond teeth are filled up in the ſame manner as the foregoing. *Vide fig.* F. At ſeven years old until eight, the marks of the corner teeth of the lower jaw fill up and diſappear. At the ſame time the tuſhes, which antecedently to this period were concave in the ſurface next to the tongue, alter their ſhape, and become round or convex. The marks of the lower teeth being all obliterated at eight years old, it will be neceſſary to have recourſe to the upper teeth, which undergo the ſame proceſs as the lower teeth, except with this difference, namely, that they do not begin to fill up until all the lower teeth are deprived of their marks, and that there is an interval of two years between every tooth in the upper jaw, whereas in the lower jaw the interval is only one year. Thus, at eight the cavities of the two middle teeth of the upper jaw begin to fill up. *Vide fig.* G. At ten, the cavities of the two next. *Fig.* H. And at twelve, the cavities of the corner teeth are totally effaced. *Fig.* I. This rule, however, is ſubject to ſome variation in different horſes, in proportion with the different qualities of their teeth, or on account of the habit of crib-biting, which wears away the teeth much faſter than in their natural courſe. In addition to theſe appearances of the teeth, other ſigns of advanced age may be diſcovered, among which the following are the moſt remarkable: The roof of the mouth or palate is conſtructed with tranſverſe ridges from one ſide to the other. *Vide fig.* G, H, I. Theſe ridges are diſtant from each other about three quarters of an inch; their edges incline upwards, by which means they ſerve as points of contact for the food, and prevent it from falling out of the mouth during maſtication.

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* As the colt cannot bite the graſs perfectly when he has ſhed the two middle teeth, it will be beneficial to feed him with maſhes of bran, and hay, until the new teeth are of a ſufficient ſize.

In the ox theſe ridges are papillous, the points taking a direction upwards, in which manner they correſpond with the direction of thoſe in the tongue.

The inſides of the cheeks of the ox are alſo furniſhed with papillæ of a pyramidal form, pointing upwards towards the throat, the office of which is probably to hold the cud in its proper ſituation while the animal chews it.

These ridges are large and diſtinct in a young horſe, but become flatter and more level as the animal advances in years, and in very old horſes they are nearly abſorbed. The front teeth or inciſores of both jaws, in a young horſe, meet exactly in a line, and perpendicularly to each other. *Vide fig.* K. As the horſe grows older, theſe teeth take a more horizontal direction, nearly in a line with the jaws, the upper teeth projecting very conſiderably over the lower teeth; at the ſame time the upper corner tooth forms a curve over the lower corner tooth. *Vide fig.* L. Furrows appear on their front ſurfaces, and their colour becomes yellow and opaque. Other characteriſtics of age may be ſeen externally, for inſtance, the eyes ſink in their orbits, the eye-lids become lean and wrinkled, and the cavity above the eye* appears more hollow. Grey hairs ſhoot out upon the forehead and the lower part of the mouth, the middle of the noſe becomes indented by the long continued preſſure of the noſe-band of the head-collar, and the lips exhibit a lean and ſhrivelled appearance, the lower lip hanging conſiderably below the upper lip. The ears alſo drop more or leſs in a lateral direction. Theſe external marks of old age, together with thoſe of the teeth, the dealer in horſes exerts his ingenuity to counteract.

He therefore commences his operations by making an opening between the ſkin and cellular membrane, at a ſmall diſtance above the eye, into which he introduces a quill, and by blowing into it, fills up the cavity and gives it a plump appearance. He proceeds next to furniſh the corner teeth with the ſame marks which they poſſeſſed at ſeven years old. For this purpoſe, he forms an artificial cavity in the head of the tooth with an engraving tool, and gives it a black colour by burning it with a hot iron. This proceſs, in the ſtable vocabulary, is called *Biſhopping*. By ſuch practices as theſe, an inexperienced perſon may be deceived; but by attending to the following obſervations, the impoſition may be eaſily detected; for although the dealer has it in his power to make marks or cavities in the corner teeth, yet he cannot alter their horizontal direction, nor reſtore them to the perpendicular approximation which is the attendant of youth. *Vide fig.* K. Neither can he re-produce the prominence of the ridges of the roof of the mouth, nor furniſh the tuſhes with their original concave ſurfaces. As it ſuits the purpoſe of the dealer to make an old horſe appear younger, ſo does he ſometimes find it convenient to make a young horſe appear older. A horſe is more ſaleable at five years old than at four, on which account the dealer attempts to produce an additional year, by drawing the corner teeth before the natural period of their dropping out. The bars of the mouth are alſo cut, to let the tuſhes protrude prematurely. But although the corner teeth are removed, and the protruſion of the new teeth is thereby ſomewhat accelerated, yet it is an unerring rule, that the animal has not attained his fifth year until the corner teeth, both of the upper and lower jaw, are complete in their ſize and appearance, and the marks of the middle teeth begin to fill up. The tuſhes alſo ſhould riſe conſiderably above the jaw.

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* This cavity, however, is ſometimes deep in a young horſe.

It is difficult to diſcover with accuracy the age of crib-biters, and horſes whoſe teeth are extremely hard; the former loſe the marks of their teeth before their uſual period, the latter retain them long after the age of ſeven years. In examining a horſe's mouth, it is neceſſary to look at both ſides of it, as a conſiderable difference in the appearance frequently occurs from the maſtication of the food being performed on one ſide of the mouth only, in which caſe the teeth on that ſide of the jaw which has moſt friction, will be moſt forward in their alteration.

CHAPTER X.

On the EDUCATION of the HORSE.

VIRGIL, in his Georgics, thus poetically gives his advice upon this ſubject:

> " Tu quos ad ſtudium atque uſum formabis agreſtem,
> " Jam vitulos hortare, viamque inſiſte domandi:
> " Dum faciles animi juvenum, dum mobilis ætas."

BUT previous to laying down any rules upon this head, it will be neceſſary to enquire into the degree of underſtanding poſſeſſed by the horſe, which, with that of other brutes, has generally been called inſtinct. Natural hiſtorians have attempted to explain this faculty; but many of them (particularly the French) have indulged in ſuch reveries, as to render their works unworthy of attention or belief.

REASON may be ſaid to conſiſt in the faculty of aſſociating ideas, and forming concluſions, independently of corporeal action, relative ſituation, or the preſence of the objects reaſoned upon. But inſtinct ſeems to be confined to the faculty of diſcriminating between noxious and innoxious food, the avoiding danger either by flight or reſiſtance, and to the performing certain neceſſary functions, which, it is ſuppoſed, the animal has not been taught by others. Inſtinct may be improved by age and experience; but it will never render a brute capable of thinking abſtractedly, or without the concurrence of certain ſignals or appearances which he has been accuſtomed to aſſociate with particular actions[*]. Thus we find in moſt animals, even of the ferocious tribe, an apparent attachment to their feeders; but it is probable that this attachment is leſs the effect of gratitude, than the reſult of ſimple recollection of the ſource from whence they ſatisfy one of the moſt urgent calls of nature. Hence the horſe can diſtinguiſh the voice of the perſon who feeds him from any other, and will expreſs his ſatisfaction by neighing; but may not this teſtimony of joy ariſe ſolely from the expectation of receiving his accuſtomed allowance of corn? For by conſtantly feeding him immediately after performing certain actions, he will acquire the habit of repeating thoſe actions when demanded of him at other periods. This practice ought to conſtitute the baſis of horſe-breaking; but how ſeldom it is adopted, may be daily ſeen throughout the country. The parties who purſue this branch of buſineſs, are too often of a ferocious diſpoſition; added to which, an habitual ſtate of intoxication tends not a little to heighten their natural cruelty. The horſe is, by nature, neither vicious nor untractable; the chief ſource of his oppoſition ariſes from fear. On this account, it is not ſurpriſing that he ſhould reſiſt, at firſt, the attempts made to ſubjugate him. But if, by gentle habit, he is convinced that no injury is intended him, he ſubmits, ſtill preſerving his natural vivacity, and becomes the pleaſant inſtrument of moſt of our comforts and luxuries. Unfortunately, however, violence and privation of reſt and food, are generally ſubſtituted for the means here recommended. The colt which is naturally dull and ſluggiſh endures this treatment, and ſurrenders himſelf to the will of his mercileſs rider; but the colt of mettle and ſpirit defends himſelf with all his powers, and, worked up to deſperation, is transformed from a generous to a miſchievous and dangerous animal.

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[*] The moſt extraordinary faculty in brutes, is that of finding their way back again, when they have been removed to a conſiderable diſtance from their homes.

This has been attempted to be explained by the ſuppoſition of their recollecting the appearance of objects on the road, or the different ſcent of the earths over which they have paſſed. But as both of theſe muſt preſent themſelves in an inverted order of ſucceſſion on their return, it is difficult to conceive that their underſtanding can be equal to the taſk of ſuch a counter-arrangement.

As a proof of the force of habit on the horſe, we may ſelect the cuſtom of whiſtling to him while he is ſtaling, or evacuating his urine. The ſound of whiſtling poſſeſſes in itſelf originally no particular ſtimulus on the urinary paſſages; but by whiſtling to a colt when ſtaling, and repeating it conſtantly upon that occaſion, ſuch an aſſociated action will in time be produced on thoſe parts, as to bring on the propenſity to diſcharge his urine whenever he hears the whiſtle. If ſo great a controul on a function naturally ſpontaneous can be obtained by habit, it is evident that the ſame principle will apply to the animal in the more eſſential parts of his education. Thus, by firing a piſtol in the ſtable, and feeding the horſe inſtantly afterwards, and repeating this practice for a ſhort time, that which was originally the cauſe of terror, will ultimately become the ſignal of gratification.

ANALAGOUS to this is the method by which they are taught to perform certain tricks with great dexterity. Admitting this plan of inſtruction to be the beſt, it is obvious that it cannot be commenced at too early an age. Hence it is adviſeable to accuſtom colts to the halter at three months old, to handle and careſs them, to lift up their legs with the hand, to ſtrike the feet gently with a hammer,

and

and to place bags ſtuffed with ſtraw acroſs their backs. By purſuing this method, a colt may be broken in, at a proper age, with very little trouble or danger.

In bringing young horſes into ſervice, it is neceſſary to conſider their age, ſize, and conſtitution. Small horſes generally are fit for labour at an earlier age than large ones, becauſe they ſooner acquire the extent of their natural growth, and have their corporeal powers more concentrated. A large raw-boned colt, with his legs badly formed, can never ſupport much fatigue, becauſe he has not only the mechanical diſadvantage of the malpoſition of his legs operating againſt him, but alſo the bulk of his body being diſproportioned to his muſcular ſtrength, muſt render his exertions more feeble, and leſs capable of long duration; an irritable habit of body will alſo prove a great impediment. Colts of the blood kind acquire ſtrength comparatively at a much earlier age, ſince it is cuſtomary to begin to race them at two years old; but their future growth is conſiderably impeded by the violent treatment which they undergo in training. On this account they ſeldom arrive to a large ſize. But this circumſtance ſhould be no cauſe of diſcouraging the breed of blood horſes, for in their natural properties they are indubitably much ſuperior to all others. This ſuperiority is not confined to internal or inviſible cauſes only; much of it ariſes from the external conformation of the body. The mechanical advantages which they derive from this ſource, conſiſt in the great length of their quarters, and the depth and capacity of their cheſts; for in their relative proportion with horſes of an ordinary ſpecies, they are much ſtronger, and poſſeſſed of greater ſpeed.

THE moſt oſtenſible characteriſtic of the blood horſe is compactneſs of fibre. This may be traced in every part, namely, ſkin, muſcle, tendon, ligament, bone, and hoof. It is this property which increaſes his ſtrength without adding to his bulk.

Other

Other parts, ſuch as the brain, heart*, and blood veſſels, are remarkable. The texture of his ſkin is finer, the hair ſofter, and the legs ſmooth and not tufted.

THE capacity of the cranium or ſkull, which contains the brain, is proportionably larger than that of the cart horſe; even the features of the face, viz. ears, eyes, and noſtrils, are on a bolder ſcale. *Vide plate* 11, *fig.* 2.

HIS principal excellence, however, ariſes from his powers of continuance, or of ſupporting fatigue.

THESE powers in the horſes of Arabia (if we may give credit to the aſſertions of travellers) are wonderful, and the more ſo when we reflect on the great heat of that climate. The true Arabian horſe of the firſt race, may be conſidered as the moſt perfect model of the ſpecies.

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* The heart of Eclipſe weighed fourteen pounds.

The blood horſes of Great Britain are originally deſcendants from this ſtock, but not from the moſt noble ſort. The natives of the eaſtern countries are very tenacious of their beſt breeds, and the Arabian horſes which have been imported into England, have been generally purchaſed by ſeafaring men, who were probably no great connoiſſeurs in horſe-fleſh, and whom the natives would conſequently endeavour to impoſe upon, by ſelling to them thoſe of an ordinary kind. In the genealogies of their horſes they are even more particular than we are in this country, and it is remarkable that they never ſuffer a mare to be exported.

As the preſent is the age for improvements in the breed of cattle, it may be an object worthy of conſideration to improve alſo the breed of horſes, by ſending a perſon properly qualified to the Eaſt to purchaſe horſes for that purpoſe; this might be done either by a ſociety of gentlemen, or at the expence of government*.

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* In regard to breeding from the natural ſtock of this country (Great Britain) it is a queſtion worthy of the attention of the phyſiologiſt, whether we ſhould not ſometimes have a better produce from the promiſcuous intercourſe of animals, than from the ſtudied ſelections of breeders, eſpecially when it may be ſuppoſed that, among the great proportion of caſtrated males, ſome might, if they had been left perfect, be in every reſpect better adapted to breed from, than thoſe which are appropriated, from neceſſity, to that purpoſe? The method which is generally adopted to improve the breed of any particular ſpecies, is by croſſing them with thoſe of a better kind; but if the ratio of improvement can be reduced to mathematical calculation, it is evident that the offspring from ſuch an union, although it may be ſuperior to the worſt of the two parents, yet will be inferior to the beſt, if, as we are taught to believe, it partakes of the qualities of them both.

Thus the produce from a blood horſe and a cart mare, will be a heterogeneous monſter, inferior to either of its progenitors; and the ſame reſult will enſue from all croſſes which are very remote from each other in their individual properties. It would ſeem, therefore, that the beſt way of improving the breed, would be to ſelect the likelieſt individuals of the *ſame* blood, and to propagate from them only.

CHAPTER

CHAPTER XI.

On PROGRESSION.

THE ſucceſſive alternation of the limbs in the motion of quadrupeds is ſo tranſitory, as to render it very difficult to diſcern, at the ſame view, their action ſeparately and collectively. The horſe may be conſidered as a machine ſupported by four perpendicular columns, each of which has its own center of gravity; but during progreſſion, each of theſe columns muſt ſhift its center, and obtain a new baſis ſucceſſively. In order to effect this, the alternate actions of flexion and extenſion of the limbs are carried on by means of joints acted upon by muſcles in different directions.

THUS the paces of the animal conſiſt of a repetition of compound circular movements of the legs upon tranferable centers. The horſe naturally employs three paces, namely, the walk, the trot, and the gallop. All other paces are generally artificial, and forced upon him by education.

THE WALK.

Borelli, in his ingenious treatiſe "de motu animalium," ſays that the horſe commences this pace with one of his hind legs firſt; "incipit greſſus pede poſtico;" and he attempts to prove the neceſſity of this law, by obſerving that the body would loſe its ſtability, if the hind leg was not advanced under it, in order to acquire a new center of gravity previous to its progreſſive motion. This rule, however, is by no means conſtant, as appears by ocular demonſtration.

The walk conſiſts of four motions, which may be particularized as follows, by the legs A, B, C, D. *Vide pl.* 13, *fig.* 1, 2.

In *fig*. 1, the horſe has advanced the near* fore leg (A) and placed it again on the ground; this action being completed, the off hind leg (C) is elevated and advanced under the body, but before it reaches the ground, the off fore leg (B) is raiſed and advanced, in order to make room for it, as is particularly the caſe when the horſe overſteps the print of the fore foot with his hind foot. When the off hind leg (C) has reached the ground (*vide fig*. 2) the horſe ſtands upon three legs, forming a triangle (A, C, D). When the off fore leg (B) alights on the ground, the near hind leg (D) commences its action, and is advanced in the ſame manner as before, and the horſe is again ſupported by three legs (A, B, C).

Thus the animal, during the walk, is always ſupported by a triangular poſition of three legs, namely, two fore legs and one hind leg, or one fore leg and two hind legs, alternately.

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* The near legs are thoſe on the ſame ſide on which the rider mounts.

The walk is, of all paces, the eaſieſt to the rider, provided he ſits on the center of the horſe's back, as it conſiſts of an alternate depreſſion of the fore and hind quarters; for inſtance, when either of the fore legs is advanced, the fore quarters muſt ſink; but when the leg, by the advancement of the body, reaſſumes its perpendicular poſition, the fore quarters will recover their former altitude. The ſame action takes place in the hinder quarters. This motion may be compared to the vibration of the beam of a pair of ſcales. The walk ſhould be light, firm, and quick. The knee ſhould be bent moderately, and the leg appear to be ſuſpended in the air for an inſtant; the foot alſo ſhould alight perfectly flat on the ground. But to be capable of a free unembarraſſed walk, it is neceſſary that the horſe ſhould be well ſhaped in his fore quarters and legs; for a quadruped that is not firm on his center of gravity when he is ſtanding ſtill, can never be firm during progreſſion. It will therefore be expedient to recapitulate ſome remarks on the external conformation contained in the former part of this work, viz. that the ſhoulder ſhould be oblique, and the fore legs ſtand perfectly ſtraight from the cheſt to the ground. If the fore legs are ſhort in compariſon with the hind legs, or if they incline too much under the body, the horſe will ſtep ſhort, and on his toe. If the cheſt is narrow, and the toes turn outwards, the legs will ſtrike each other during their motion, particularly when going upon rough uneven ſurfaces. If the toe turns inwards, and the cheſt is too wide, the horſe will tread principally on the outward quarter of the foot, and conſequently will be more unſteady than if he preſſed equally upon every part. The neck ſhould be handſomely united with the ſhoulders, and the head ſhould be carried with a light and elevated air.

IN conjunction with this diſpoſition of the fore quarters, it is neceſſary that the hind quarters ſhould be well conſtructed, and in a proper poſition, namely, that the leg from the hough to the ground ſhould be ſtraight, and in a perpendicular line under the articulation of the thigh bone with the pelvis, commonly called the round bone. If the hind legs are placed too far behind the croupe, they cannot advance ſufficiently under the body when in action, whence three fourths of the weight of the body will be thrown on the fore legs, by which their action muſt inevitably be impeded. If a horſe walks well, he generally excels in every other pace*.

It is difficult, however, to confine young mettleſome horſes to a walk, and it requires great temper and perſeverance, together with a light firm hand, to accompliſh it. Whenever the horſe changes to a trot, he ſhould be ſtopped immediately for a moment or two, and then ſuffered to proceed again.

But this ſhould not be done by roughly checking him with the bridle, or chaſtiſing him either with whip or ſpur, as ſuch practices only render him more impatient and unſteady. If the horſe naturally carries his head well, it is beſt to ride him with a moderately looſe rein, raiſing the hand when he feels likely to change into a trot. A tight rein ſhould always be avoided, for if he carries his head low, it tends to deaden his mouth, and to teach him a bad habit of depending on the bridle for ſupport, in which caſe he always goes heavily and on his ſhoulders. It is probably of ſome advantage to uſe the words *walk*, *trot*, *gallop*, when you wiſh your horſe to enter upon any one of theſe paces.

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* The word *excels*, is not meant to ſignify ſuperior ſpeed; it is intended to be applied only to the property of a true and harmonious manner of going.

THE TROT.

In the walk, the horſe moves all his legs ſeparately and in regular ſucceſſion; but when he is excited to accelerate his pace, he moves two at once, viz. a fore and a hind leg diagonally, by which means he paſſes over as much ground with two motions in the trot, as he does in the walk with four.

BUT as in the trot he is ſupported by two legs only, he is more liable to fall in that pace than in either the walk or the canter, in both of which he has always three legs on the ground at the ſame period. The trot, particularly in the circle, is well adapted to give freedom and elaſticity of motion to a young horſe, and to confirm him in his center of gravity. In performing this leſſon, the outſide legs work on a larger circle than thoſe on the inſide; he is conſequently obliged to advance the outſide ſhoulder as much as poſſible, to keep pace with the inſide ſhoulder, which moves on a ſmaller extent of ground. The ſame thing takes place alſo in the outward hind leg, for the ſame reaſon. In working a horſe in the circle, it is cuſtomary to rein him up tight, ſo as to confine his head to one particular poſition; but this practice tends very much to confine him in his ſhoulders, and thereby to defeat the intention of the leſſon.

THE horſe ſhould have his head at liberty, which will permit him to advance his ſhoulders, and to move with greater elaſticity. When a horſe is forced in the trot beyond his powers, or does not carry himſelf well on his center, he is apt to confuſe it with a canter, viz. to trot with his fore legs, and canter with his hind legs, and vice verſa. Whenever this confuſion occurs, he ſhould be checked inſtantly, for this compound motion both reduces his ſpeed, and renders him more unſafe in his going. If, from an upright ſhoulder or bad poſition of the fore leg, the horſe goes heavily before, he will be liable to ſtrike his fore feet with the toes of his hind feet, and produce a diſagreeable noiſe, called *Forging*. This fault may be corrected by throwing him more on his haunches, and by attending to a proper mode of ſhoeing. As the fault ariſes, in a great meaſure, from the fore foot not being quick enough in its motion to get out of the way of the hind foot, it is evident that this may be remedied by accelerating that motion, and this may be effected by keeping the fore foot as low at the heel as poſſible, by which means the extenſion of the flexor muſcles of the leg being increaſed, they will be ſtimulated to act ſooner than they otherwiſe would do, and the gaining but a moment of time in their action is ſufficient for the purpoſe. At the ſame time the toes of the hind feet ſhould be ſhortened as much as poſſible, and the hoof ſhould project, in a ſmall degree, beyond the ſhoe, which will prevent the iron from ſtriking the fore foot. Horſemen generally riſe in the ſaddle during the trot, by which method they avoid the concuſſion they would otherwiſe experience. But by this cuſtom they certainly interrupt the harmony of the horſe's motion, by obliging him to dwell longer on one leg than the other, in doing which he accommodates himſelf to the motion of his rider. Beſides this interruption, it greatly incommodes the animal, if it is not performed very ſteadily and perfectly on the center of gravity; for nothing can be ſo ungraceful in appearance, as the figure of a rider ſwinging his arms and legs backwards and forwards as if they did not belong to his body.

FIG. 1, *plate* 14, repreſents the horſe in a moderate trot, in which pace he covers no more ground at each motion than extends from one hind leg to the other. *Vide letters* D, C.

BUT in *fig.* 2, where the trot is accelerated, he not only covers more ground by the greater extenſion of his legs, but gains alſo an additional ſpace by the momentum of his body during the period when all his legs are in the air. Thus the *letter* C marks the ſpot which the near hind foot occupied before it was raiſed in the air, and the *letters* A, B, deſcribe the ſpots of ground to which the near fore foot and off hind foot will reach when they alight on the earth. This momentum is, in a great meaſure, loſt, when the horſe goes in harneſs, as the vis inertiæ of the carriage is ſufficient to counterbalance it.

When a horſe, whoſe fore legs are much ſhorter than his hind legs, or whoſe ſhoulders are very upright, trots faſt, he is obliged to go with his hind legs very wide, ſo that his hind feet may come on the outſide of his fore feet. By this means he ſinks his croupe, and brings it more on a level with his fore quarters, and at the ſame time he avoids ſtriking his fore feet with his hind feet. Horſes of this conformation ſometimes go in the ſame form as dogs generally do, namely, with their fore and hind legs in two different lines of direction, by which one hind foot comes on the outſide of the fore foot, and the other hind foot between the two fore feet, and this is done with the ſame intention as in the former inſtance. They are, however, very unſafe to ride, for the hind foot is always more or leſs in danger of catching the fore foot, in which caſe, except the ſhoe is torn off, they muſt inevitably fall with great violence. The elongated or darting trot, is computed not to be ſo ſpeedy as the ſhort quick trot; but it furniſhes a proof of great ſtrength and elaſticity of muſcle, and is more peculiar to blood horſes than to thoſe of any other deſcription. The motion, however, is ſo different from the ſhort contracted pace of common horſes, that bad riders are frequently puzzled to accommodate their ſeats to it.

Horses have been ſaid to poſſeſs the ability of trotting eighteen miles within the hour; ſuch horſes do not trot, but run, that is to ſay, move all their legs ſeparately and ſucceſſively as in the walk; whereas in the trot, a horſe moves two at once, viz. a fore leg and a hind leg diagonally. Cuſtom, however, has determined it to be a trot when the horſe does not riſe into a gallop. It is a law in the animal œconomy, that parts which are moſt exerciſed become the ſtrongeſt, and that animal bodies will perform particular motions to which they have been moſt accuſtomed with greater facility than others. Thus horſes which have been kept ſolely to trotting, cannot gallop ſo faſt as they can trot, nor for ſo long a continuance. But the ſame powers which enable them to excel in the trot, would alſo have rendered them faſt gallopers, if they had been employed in that action. Hence it is that particular ſtallions acquire the reputation of getting faſt trotters, or high leapers; for as every perſon who breeds a colt from horſes of this deſcription concludes that theſe qualities muſt be ſpecifically generated with him, he conſtantly exerciſes him in theſe purſuits, until the muſcles which are principally employed acquire a ſuperior ſtrength to the reſt of the body, and furniſh the animal with the deſired quality.

The CANTER and GALLOP.

THE canter is not generally a natural pace. When the horſe is excited to move his ſtation from one place to another, he performs it with a velocity proportionate to the exciting cauſe. Thus he changes from the walk to the trot, and from the trot to the gallop, according to his inclination.

IN each of theſe changes he acquires an addition of ſpeed; but as the trot is equal in ſpeed to the other three, viz. two fore feet and the off hind foot, ſtationary. This could not be repreſented in the plate, as it would have given the appearance of walking inſtead of cantering, but upon an attentive obſervation in the living ſubject, it will be found to be true. In the canter, the horſe moves obliquely, by advancing either his right or left ſhoulder in conformity with the leading leg. Thus, if he leads with the right fore leg, the right hind leg muſt follow, and be advanced more under the body than the left hind leg. By this poſition, the feet deſcribe a rhomboidal quadrangle (A, B, C, D) which gives greater ſtability to the body during progreſſion, than if the animal moved with an equilateral projection of his limbs. If the horſe leads with the right fore leg B, and follows with the left hind leg D, he is ſaid to canter falſe. This may be eaſily felt by the rider, as the body of the animal will move in a tortuous, unharmonious manner. Whenever this takes place, he ſhould be ſtopped immediately, as he incurs the danger of falling. It is eaſieſt to the rider when the horſe

THE GALLOP

Is commonly divided into the hand gallop and the full gallop; but as this diſtinction applies more to the different degrees of velocity than to any peculiarity in the pace, it will be unneceſſary to enter into a ſeparate deſcription. In the gallop, the horſe leads with one fore leg ſomewhat advanced beyond the other, but not ſo much ſo as in the canter (*fig.* 1) and when he is going at his utmoſt ſpeed, the legs are nearly equal (*fig.* 2). The fleeteſt gallopers carry their bodies perfectly horizontal, or, in other words, bear the leaſt reſemblance in their motion to that of a rocking-horſe.

For, in the action of progreſſion, it will be found that all bodies will be retarded in their progreſs in proportion as they depart from a right line, either horizontally or perpendicularly. None but horſes of great powers are able to gallop in this form, for to ſupply the want of undulation in the

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body,

this accounts for their bolting out of the courſe ſo frequently during a race.

To aſcertain the extent of ground which the horſe paſſes over at each ſtroke, it will be neceſſary to meaſure the diſtance between two ſucceeding impreſſions of the hind feet, viz. from A to B, *fig.* 2.

Horses ſometimes change the leading leg during the gallop: if they change the hind leg at the ſame time in uniſon with the fore leg, it furniſhes a proof of great ſtrength and command of their limbs; but if they change the fore leg without the hind leg, they become diſunited, and ſhould be inſtantly ſtopped.

It is a great advantage to a horſe to be able to change his leading legs in this manner, as he thereby relieves either ſide of his body alternately. It will be found a good practice to teach him to perform

form this change by ſignal from the hand and heel of his rider. The beſt method to accompliſh it, is to gallop him in a ſerpentine direction, obliging him to change to right or left, in conformity with the line of his direction. A horſe ſhould never be ſtopped ſuddenly in the gallop, as it endangers his loins and houghs, and often produces an irrecoverable injury. Inſtances have occurred of the legs being broken by the concuſſion, and the ſudden and violent contraction of the muſcles, which take place on ſuch an occaſion.

THE PASSAGE.

The paſſage is a term in the manege properly ſignifying the contracted trot, in which the horſe moves with his haunches far advanced under him, and his fore quarters and legs elevated as much as poſſible. This term is generally and improperly made uſe of when the horſe moves ſideways either to the right or left, deſcribing two parallel lines of direction with his fore and hind feet. This

pace

pace is more properly denominated, *Head or tail to the wall.* As the horſe acquires the habit of preſerving his center of gravity by moving in a right line either forwards or backwards, ſo will he, by the above method, acquire the faculty of preſerving his center when moving in a lateral direction.

THE advantages ariſing from this pace, conſiſt in enabling the horſe to change his line of direction, either to the right or left, with greater facility, whence he will avoid obſtacles much more quickly, and will be leſs liable to fall in croſſing ruts or other uneven ſurfaces, and he will alſo be more expert at cramp leaps and perplexing ſituations, in which a different horſe would be unable to proceed.

CARRIAGE horſes likewiſe will turn with leſs trouble and conſtraint when they have learned this pace. As this motion is perfectly novel and unnatural to a young horſe, the gentleſt means ſhould be employed in teaching him. It is therefore beſt to begin it on foot, in the following manner, namely, one perſon ſhould place himſelf on the near ſide of the horſe's head, and hold the near or left rein in his left hand, and the off or right rein paſſing over the neck to the near ſide in his right hand. Another perſon ſhould ſtand oppoſite the hind quarters on the ſame ſide with a whip. The perſon holding the reins ſhould then gently urge the horſe to move, but ſhould prevent him from advancing, by lightly checking him with the bridle, and inclining his head rather towards the off ſide, at the ſame time the perſon holding the whip ſhould touch him gently on the quarter, which will oblige him to move his hind legs in the ſame direction. It is neceſſary, however, to obſerve, that his ſhoulders ſhould incline towards the ſide on which he is going rather more than the hind quarters, by which means he will move in an oblique manner. At firſt he ſhould not be forced to continue this motion beyond three or four paces at a time, for fear of irritating him, as from not knowing what is required of him, he feels in conſtant apprehenſion of falling.

As the horſe recovers his center in a ſtraight line of progreſſion, by advancing one leg beyond the other, ſo will he recover his center in a lateral progreſſion, by croſſing one leg beyond the other. Thus, if the horſe moves ſideways to the right, he croſſes over his left fore and hind legs beyond the right fore and hind legs at the ſame period, and thereby recovers his perpendicular poſition. In going to the left he croſſes with his right legs. But he would be unable to croſs his legs if his body moved perfectly laterally, he is therefore obliged to advance one ſhoulder beyond the other by moving obliquely.

When the horſe has been accuſtomed to this pace for ſome time, it will be neceſſary that he ſhould be taught to perform it with a rider on his back. For which purpoſe, if he is required to go to the right, the rider ſhould gently ſhorten the right hand rein, and croſs his left hand with the left rein over the withers to the right ſide, at the ſame time gently preſſing the horſe's flank with his left leg, he will oblige his croupe or hind quarters to move in a parallel direction with the fore quarters. The reverſe of this is to be obſerved in going to the left. This pace forms the baſis of all military movements in the cavalry, and muſt ever give a ſwordſman a moſt decided ſuperiority over another whoſe horſe poſſeſſes not the ſame qualifications, for, by the ſmalleſt ſignal from hand and heel, he can either approach or avoid his adverſary, as occaſion may require.

CONCLUSION.

NO amuſement can be more inſtructive, or more acceptable to men of rank and fortune, than the cultivation of natural hiſtory; and no branch of it can be more intereſting than that which relates to the horſe.

How barren, indeed, of delight is the condition of him who paſſes through life an incurious ſpectator, ignorant of the common properties even of objects which are moſt familiar to him, and which are indiſpenſably neceſſary to his exiſtence.

His mind, perpetually recurring on itſelf for ſupport, tries in vain to ſhake off the burden of indolence, and too frequently ſeeks employment in purſuits of a degrading and unprofitable nature.

In proportion with his want of knowledge, he will be the dupe of impoſtors and the prey of villains, and in no inſtance will he be more expoſed to their artifices, than in that which is combined with the preſent ſubject.

Desirable muſt be an acquaintance with the conſtituent principles of the numerous productions which the munificent Creator has provided for the benefit of man; for it is not only ſatisfactory to comprehend the uſes to which they may be applied, but it is alſo neceſſary to be capable of diſtinguiſhing that which is friendly or hoſtile to their œconomy.

But natural hiſtorians appear to have directed their reſearches principally among thoſe animals which inhabit but a ſmall part of the globe, while they wards perfection. I ſhall therefore conclude with the words of Cicero, which, in the preſent caſe, are exceedingly applicable: "Multum reſtat operis, "multumque reſtabit, nec ulli nato poſt mille "ſecula præcludetur occaſio aliquid adhuc adji- "ciendi."

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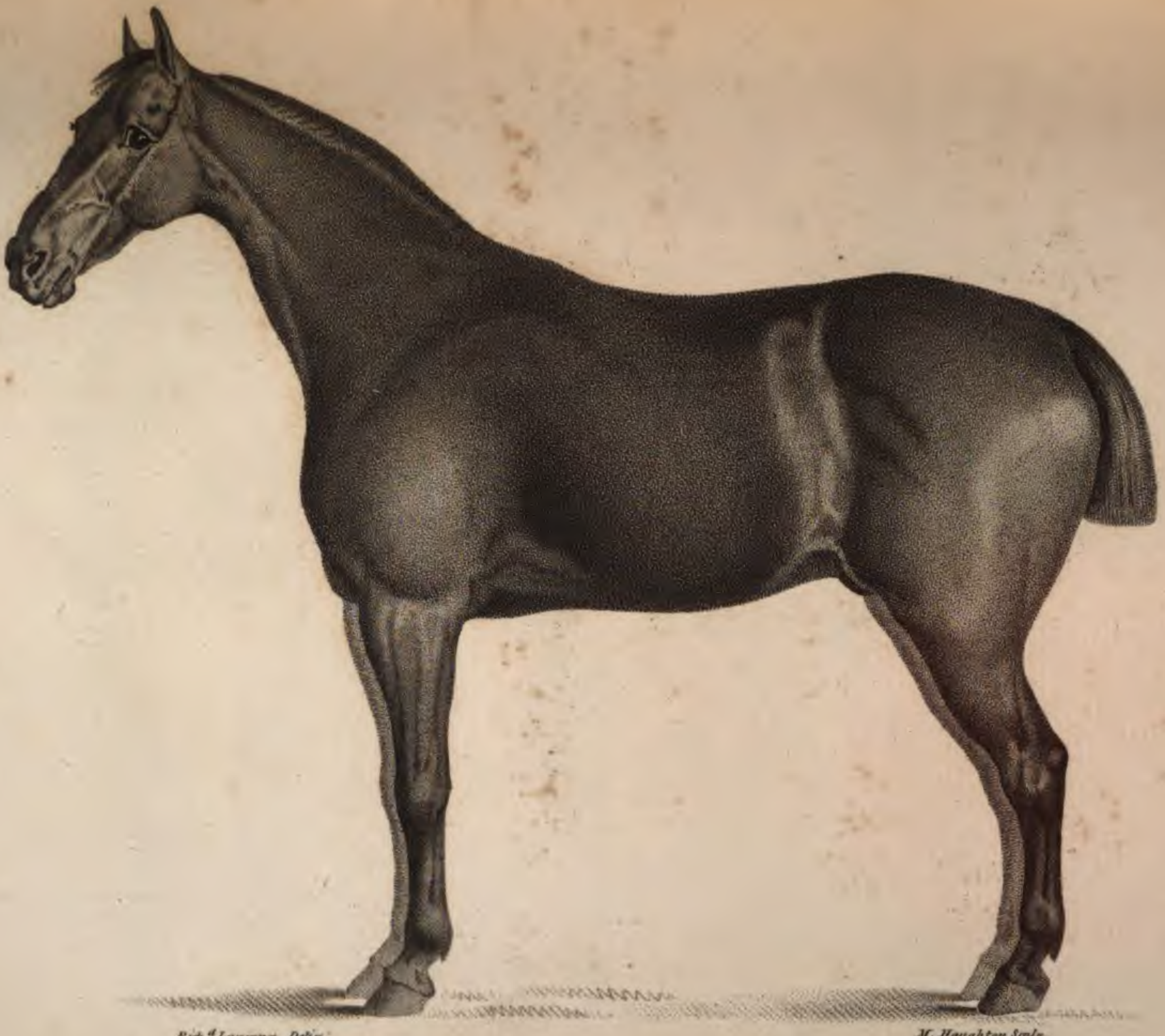
FINIS

BIRMINGHAM, PRINTED FOR KNOTT AND LLOYD, AT T. A. PEARSON'S OFFICE, HIGH-STREET.



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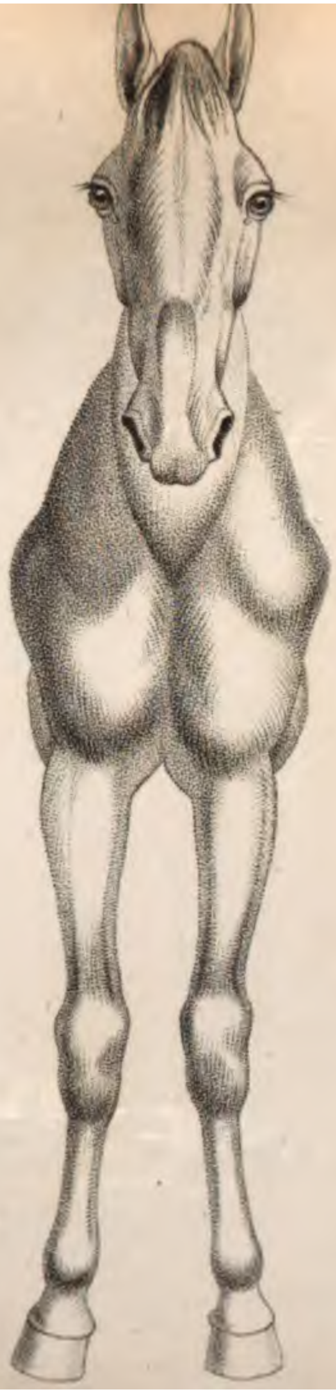

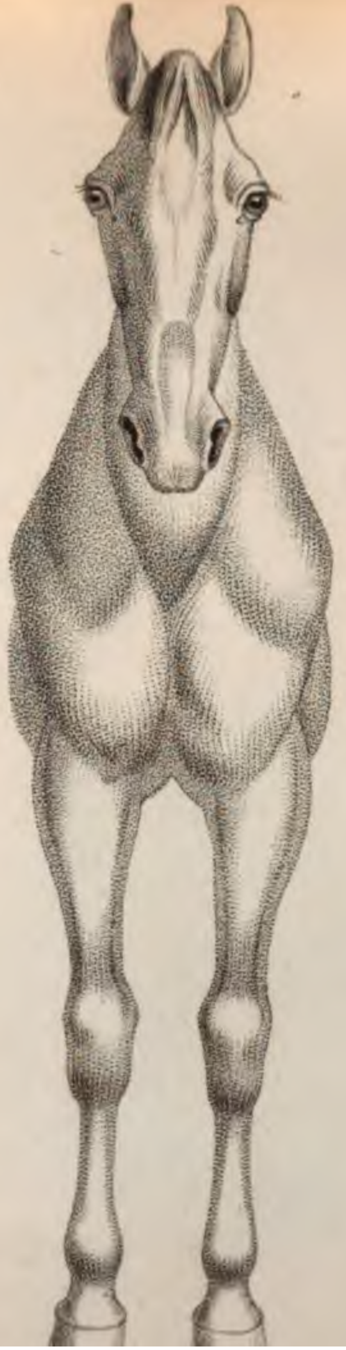

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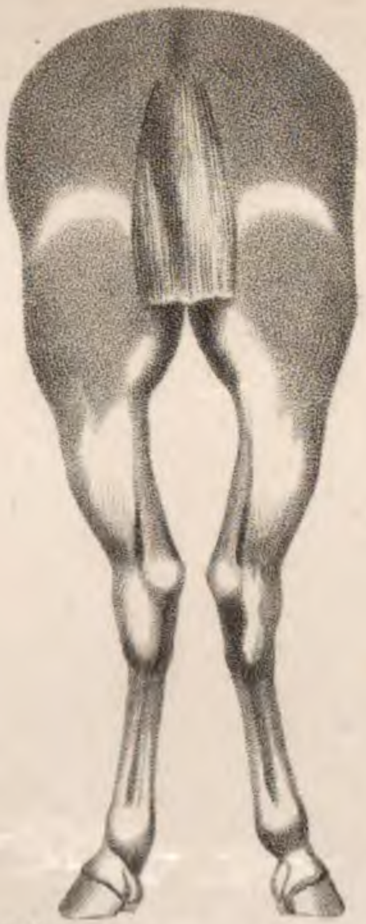

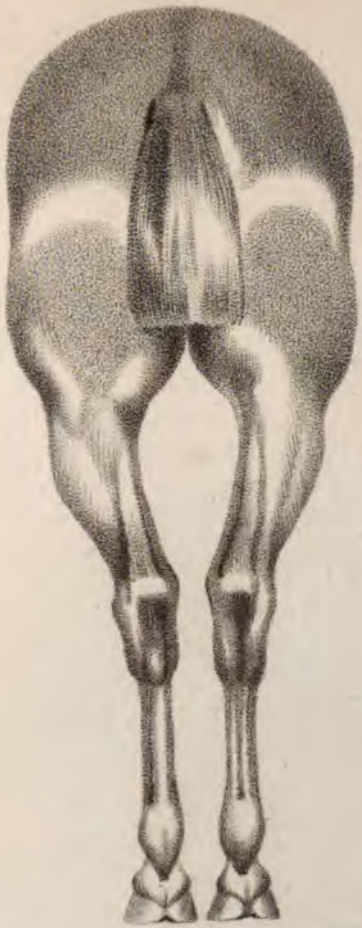

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EXPLANATION.

PLATE I.

AA. THE line which divides the body from the legs, giving the proportion of both.

B. C. The lines which divide the body from the fore and hind quarters, giving their reſpective proportions.

D. The elbow.

E. The ſtifle.

F. The knee.

G. The fetlock.

H. The hough.

I. The hip.

K. The point of the buttock.

L. The hip joint, commonly called the whirl-bone;—the dotted line from L to E deſcribes the poſition of the thigh bone.

MM. The thigh.

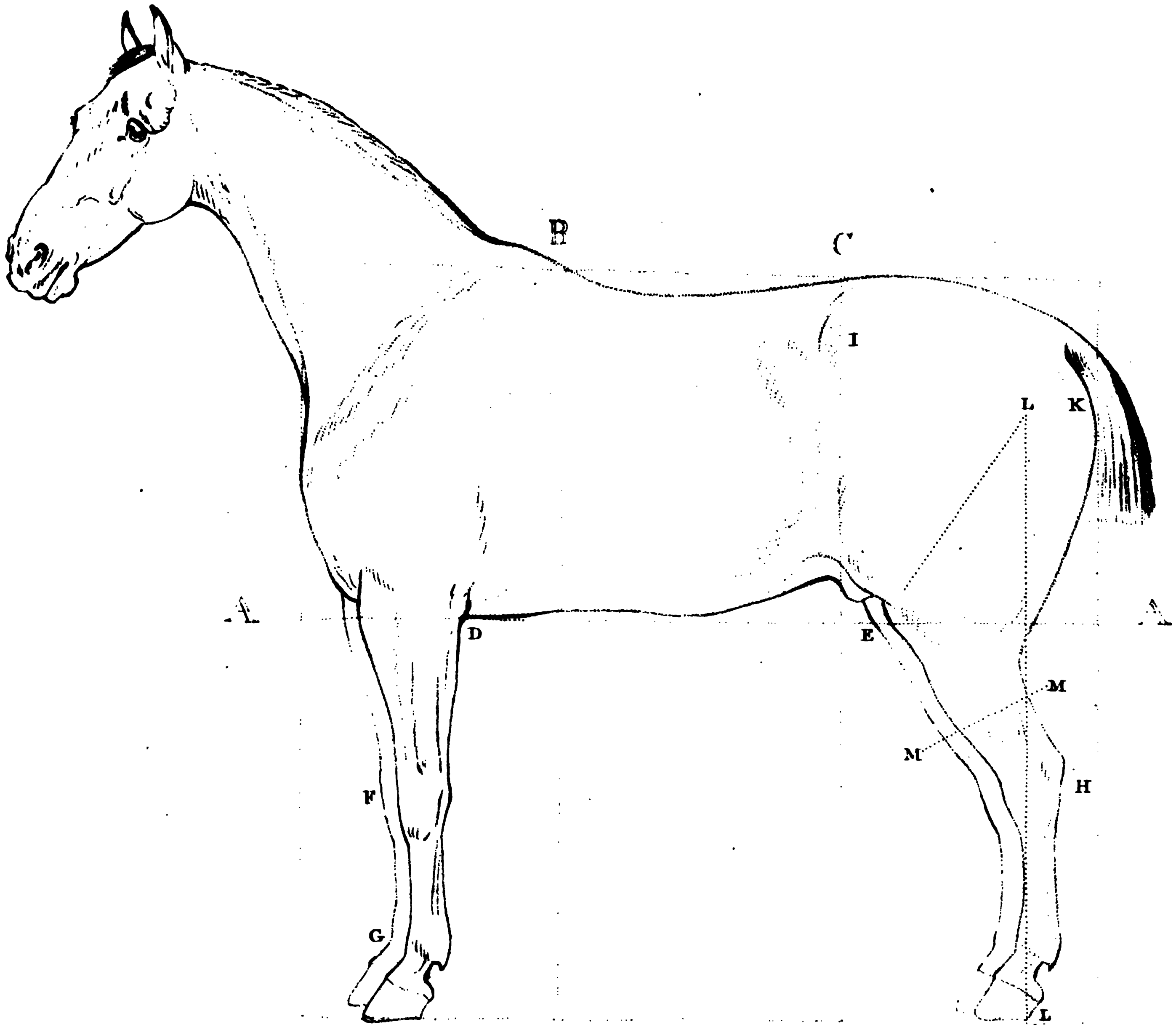

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PLATE II.

FIG. 1 repreſents the proper oblique poſition of the ſhoulder blade. C marks the center of its motion. A and B give the extent of its motion; E, the point of elevation of the lower part of the ſhoulder when it is advanced.

Fig. 2 repreſents a ſhoulder blade more perpendicular in its poſition; A and B, the extent of its motion; E, the point of elevation, which is not ſo high, nor ſo extenſive, as in fig. 1.

Fig 1.

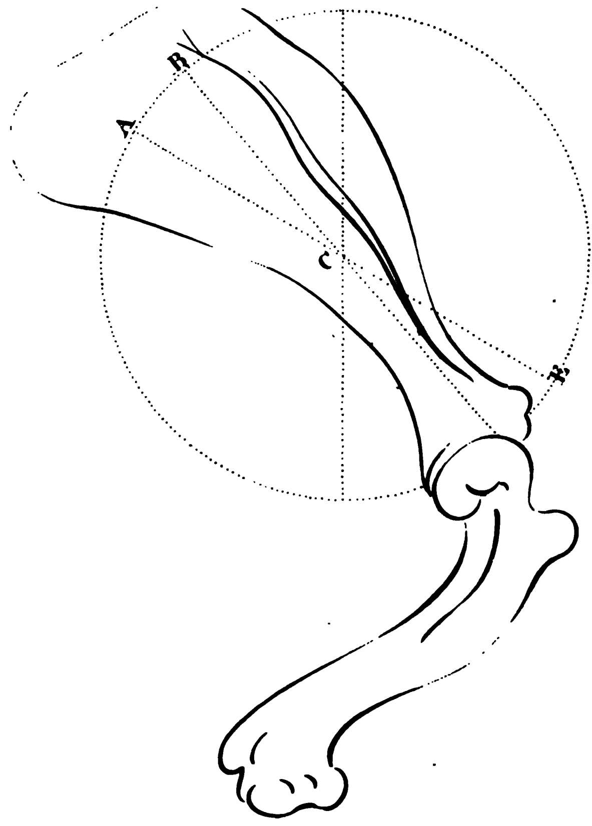

Fig 2.

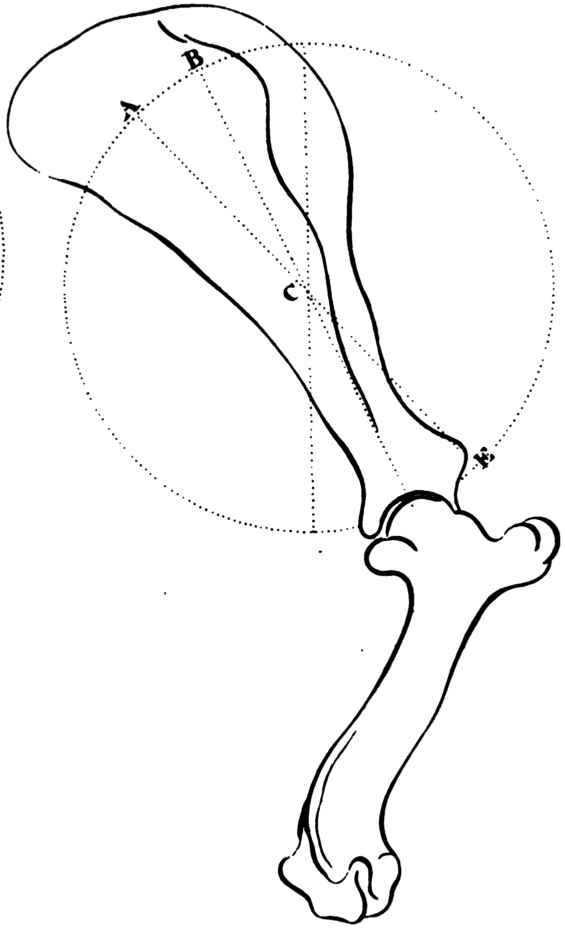

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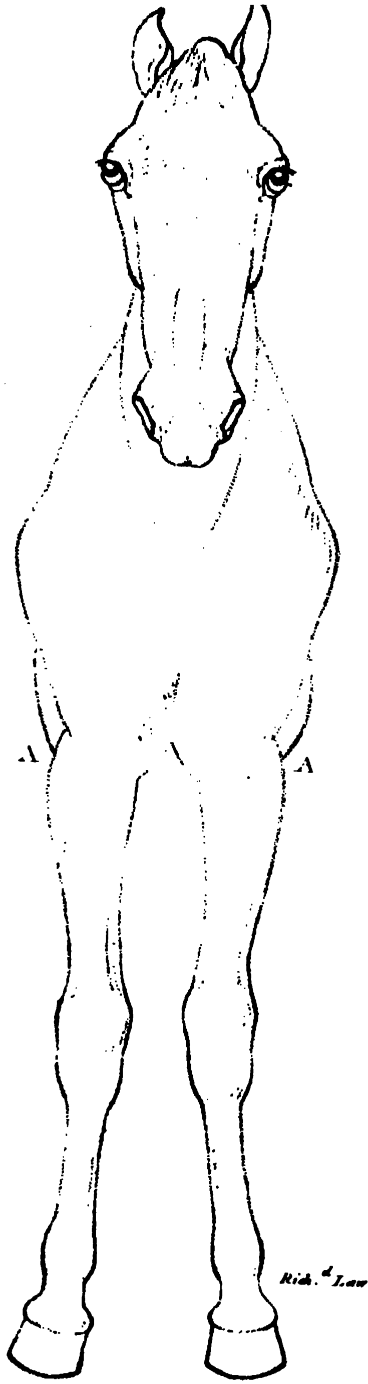
PLATE III.

FIG. 1 and 2 repreſent the front view of two horſes.

Fig. 1 deſcribes the malpoſition of the legs from the knee to the ground.

AA. ſhews the elbow inclined too much inwards towards the ribs.

Fig. 2 gives the proper poſition of the fore legs.



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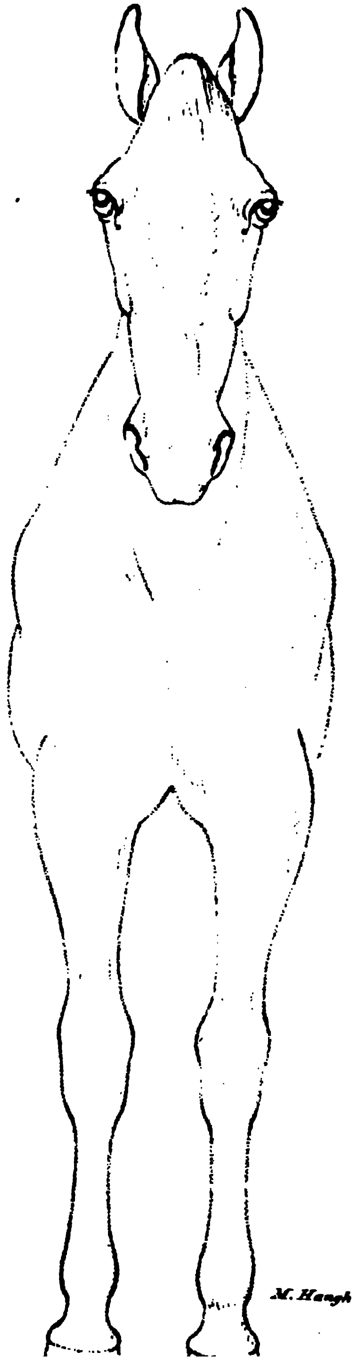

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PLATE IV.

FIG. 1 repreſents a back view of the hind quarters of an ordinary bred horſe, with a flat croupe and high hips.

AA. ſhow that poſition of the houghs, commonly termed cow-houghed.

Fig. 2 repreſents a back view of the blood horſe.

BB. ſhow the croupe to be more circular, and the hips lower.

AA. ſhow the ſtifle to be wider than the croupe.

CC. The proper ſtraight poſition of the hind legs.

Fig. 1.

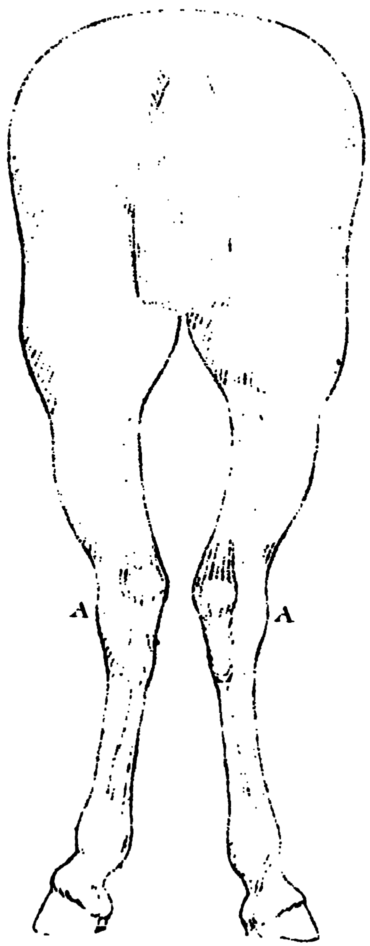

Fig. 2.

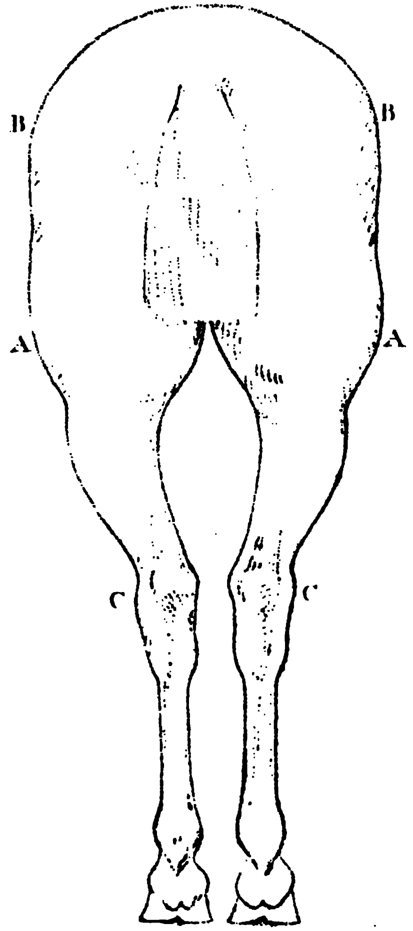

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PLATE V.

FIGURES 1 and 2 repreſent two horſes of equal height and length. The points in which they differ conſiſt in fig. 1, being ſhorter in the back and longer in the quarters than fig. 2.

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PLATE VI.

FIG. 1 repreſents the hoof of a horſe contracted in the heels by bad ſhoeing.

Fig. 2 repreſents the hoof of a colt, of which the quarters and heels are the wideſt parts.

Fig. 3 gives a view of the hoof when ſhod.

Fig. 4 gives a ſection of the hoof, deſcribing the laminated fibres of its inward ſurface, correſponding with thoſe of the coffin bone.

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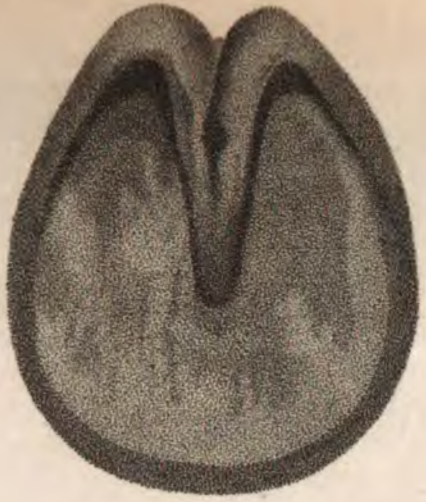

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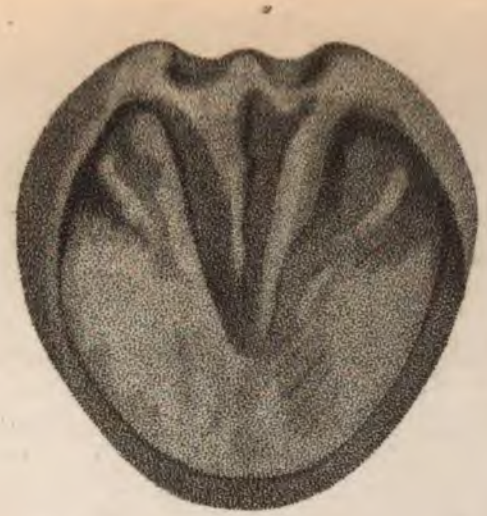

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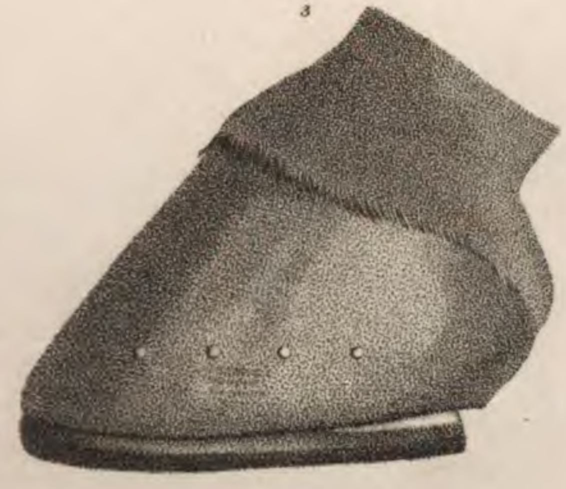

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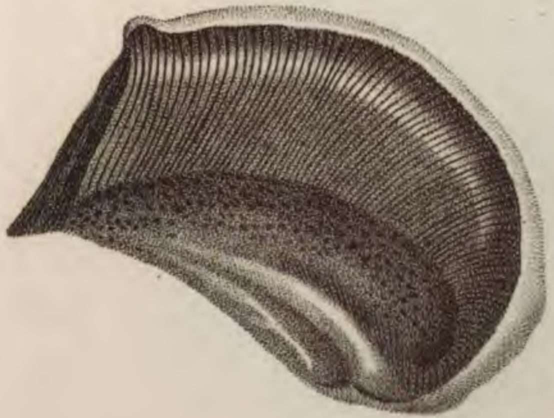

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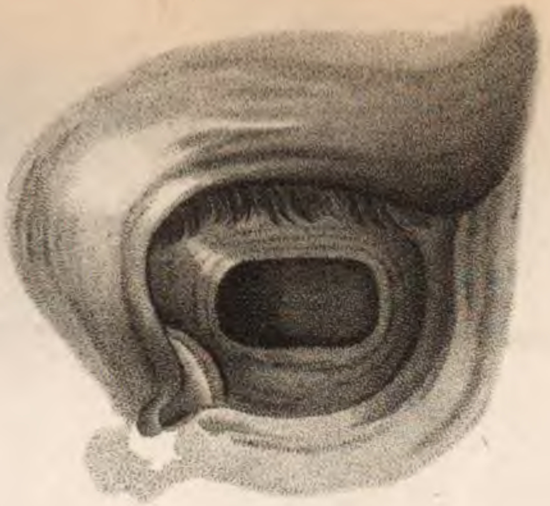
PLATE VII.

A. REPRESENTS the eye of the horſe, in which the pupil is dilated, being in an obſcure light.

B. repreſents the pupil contracted by the ſtimulus of a ſtrong light.

C. ſhows the membrana nictitans, or hawe, brought half way over the eye.

D. ſhows the white ſpecks in the pupil, occaſioned by a partial opacity of the cryſtalline lens, or an incipient cataract.



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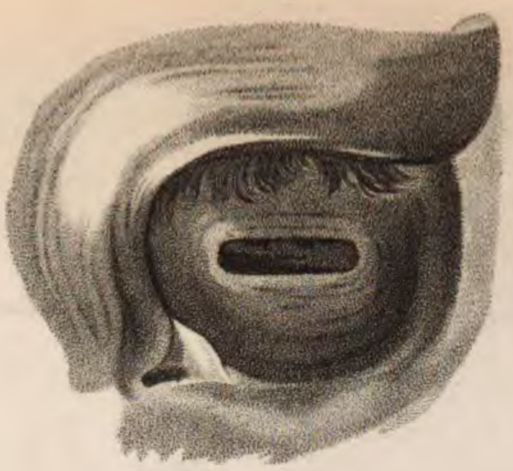
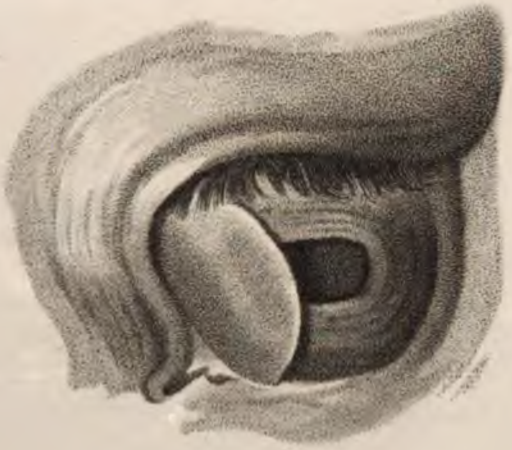


C



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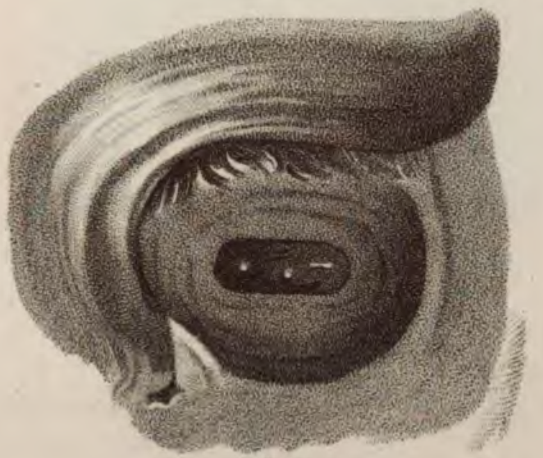

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PLATE VIII.

FIG. 1 repreſents the outſide profile view of the fore leg. Letter B deſcribes a ſtrain in the ſheath of the tendons.

Fig. 2. The inſide profile view of the fore leg. Letter A, a ſplent; D, a windgall; K, a ſand-crack.

Fig. 3. Front view of the fore leg. Letter C, ring-bone.

Fig. 4. Back view of the fore leg. Letter L, mallenders.

Fig. 5. Outſide profile view of the hind leg. Letter I, thorough-pin; H, curb.

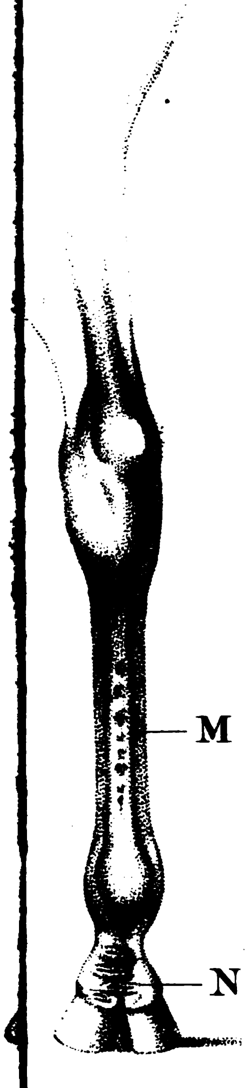
Fig. 6. Inſide profile view of the hind leg. Letter G, blood-ſpavin; F, bone-ſpavin.

Fig. 7. Back view of the hind leg. Letter M, rat-tails; N, the greaſe.

Fig. 8. Front view of the hind leg. Letter O, ſallenders.

Plate.

7



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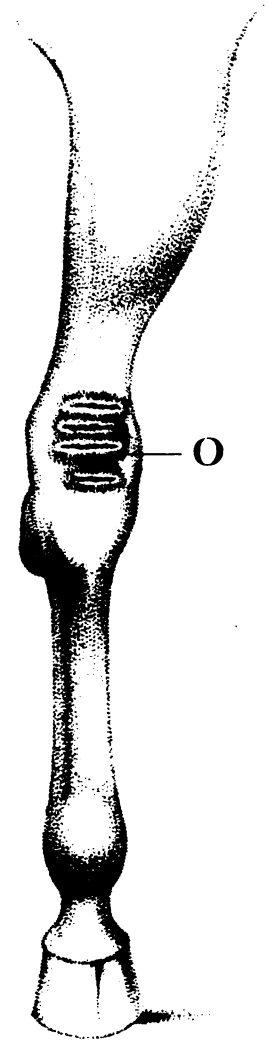

Drawn

Engraved by Matthew [illegible]

FIG. 1 rep
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Fig. 2. Th
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Fig. 3. Fro

Fig. 4. Bac

Fig. 5. Out
H,

Fig. 6. Inſi
F,

Fig. 7. Bac
grea

Fig. 8. Fron

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PLATE IX.

THIS plate is intended to deſcribe, principally, the peculiar formation of the throat of the horſe. With this view, the other parts of the head have been omitted, and ſome liberties have been taken with the perſpective, in order to render thoſe parts which are deſcribed more conſpicuous.

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PLATE X.

FIG. 1 repreſents the view of the upper orifice of the ſtomach, with the fibres of the muſcular coat croſſing each other in their direction.

Fig. 2 ſhews a piece of the œſophagus or gullet, with the fibres of its muſcles, imitating baſket work, by taking their attachments beyond the origin of each other.

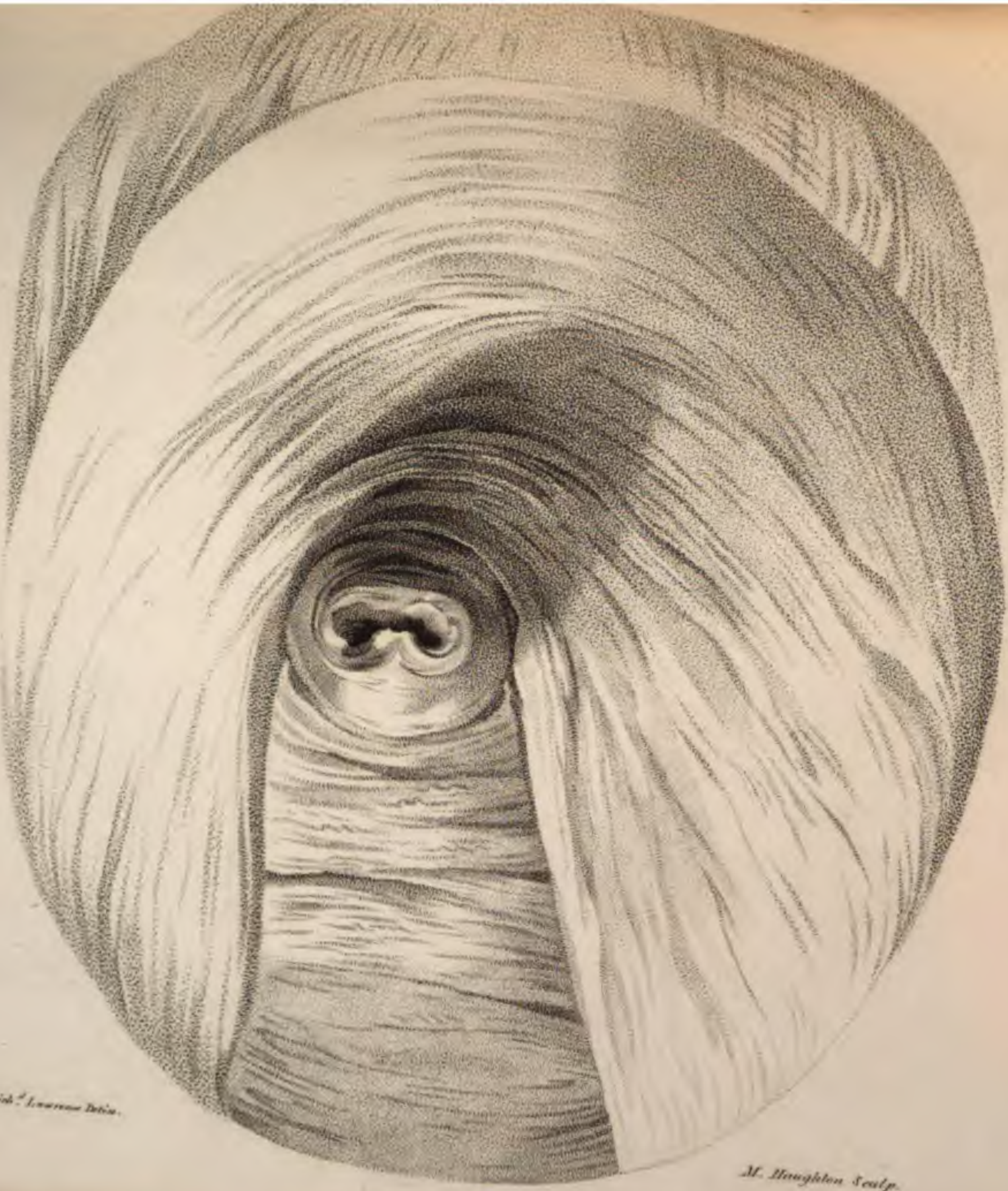

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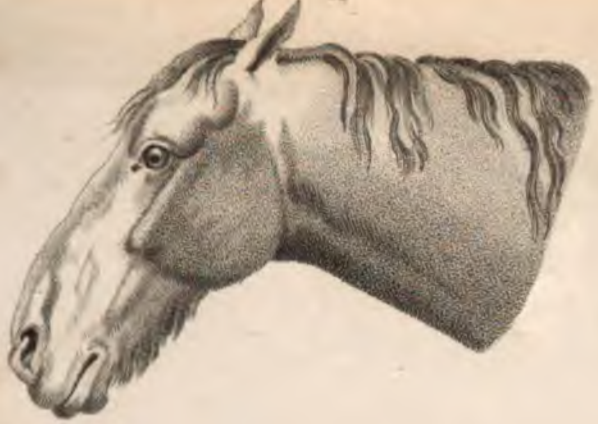
PLATE XI.

FIG. A. repreſents the head of a cart horſe, the features of which are ſmall, and its union with the neck abrupt and void of grace.

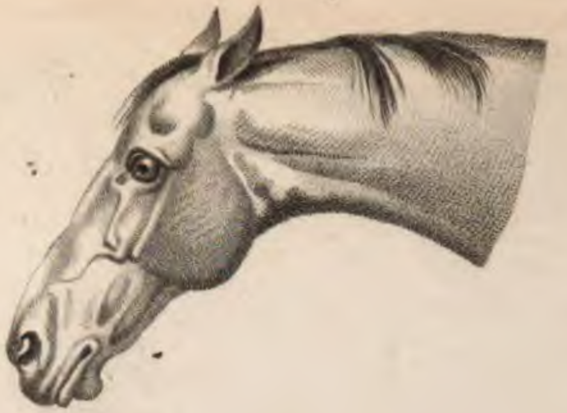
Fig. B. repreſents the head of a blood horſe. The features are larger in proportion, and more animated, and the neck proceeds from the head with a more eaſy and elegant line.

The lower B deſcribes the front view of the head of the blood horſe, which is ſhorter and broader in the forehead, proportionably, than the cart horſe A.

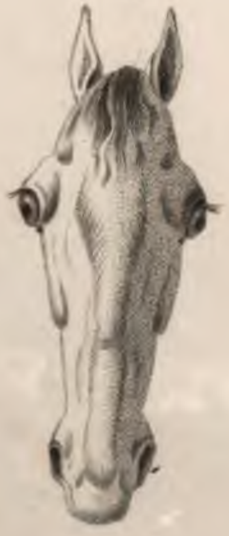
A



B



A



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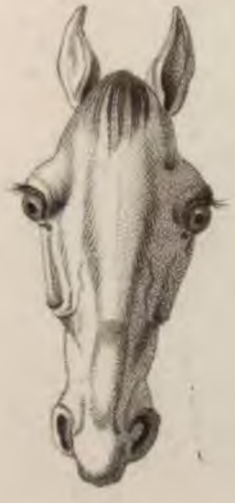

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PLATE XII.

A. REPRESENTS the front teeth of the lower jaw of a colt until two years and a half old.

B. The lower jaw at two years and a half old, in which the two middle teeth have been ſhed.

C. Two new middle teeth, the two adjacent teeth ſhed.

D. Four new teeth, the two corner teeth ſhed.

E. The ſet of new teeth complete, the marks of the two middle teeth being filled up.

F. The marks of the four front teeth filled up.

G. The front teeth in the upper jaw, the two middle teeth having their cavities filled up.

H. Ditto, the marks of the four front teeth being filled up.

I. Ditto, the marks of all the teeth effaced.

K. Profile view of the mouth of a young horſe.

L. Ditto of the mouth of an old horſe.

Plate 12.

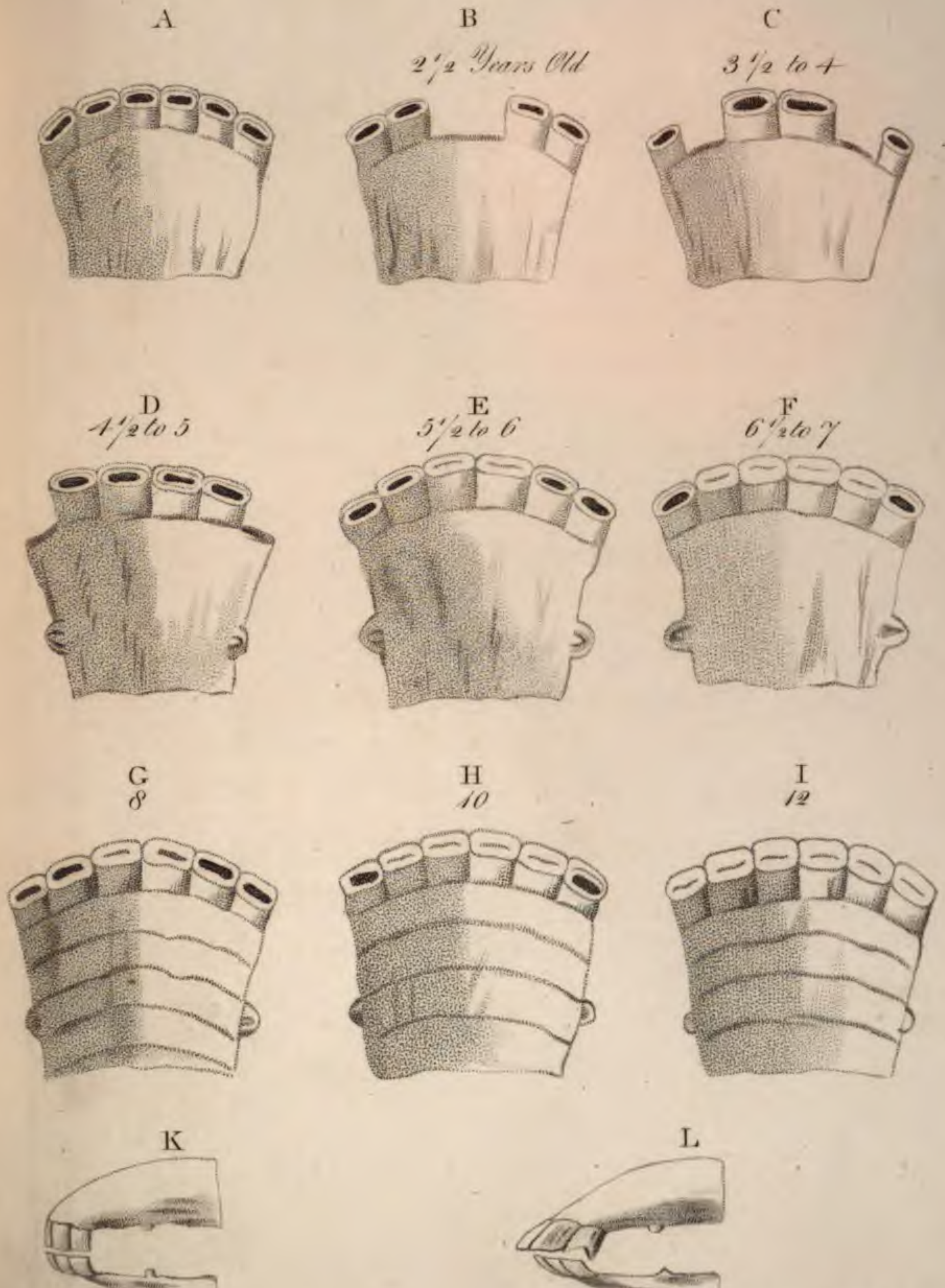

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PLATE XIII.

FIG. 1 repreſents the horſe in the walk, in which pace three legs are always on the ground at the ſame time. The off fore leg B having completed its action, is preparing to riſe, at which moment the off hind leg C alights on the ground, and forms the triangle A, C, D, as ſhown in fig. 2.

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PLATE XIV.

FIG. 1 repreſents the horſe in a gentle trot. C and D mark the diſtance of ground paſſed over at each motion.

Fig. 2 repreſents the darting or elongated trot, in which the horſe gains an additional ſpace by the momentum of his body during the period when all his legs are in the air. Thus the letter C marks the ground which the near hind foot occupied before it was elevated; and the letters A and B mark the ſpots to which the near fore foot and the off hind foot will arrive when they have completed their action.

Plate 14.

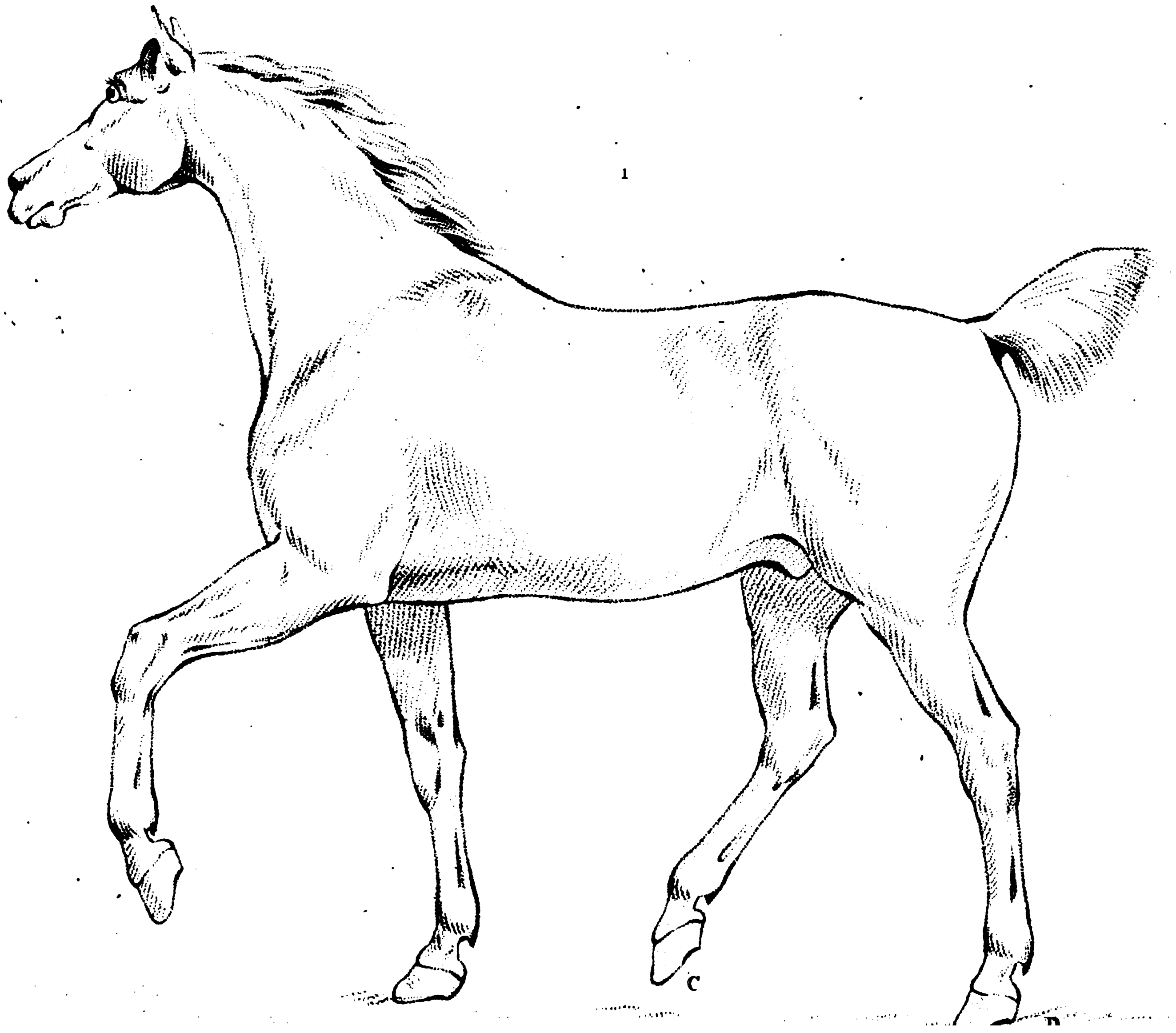

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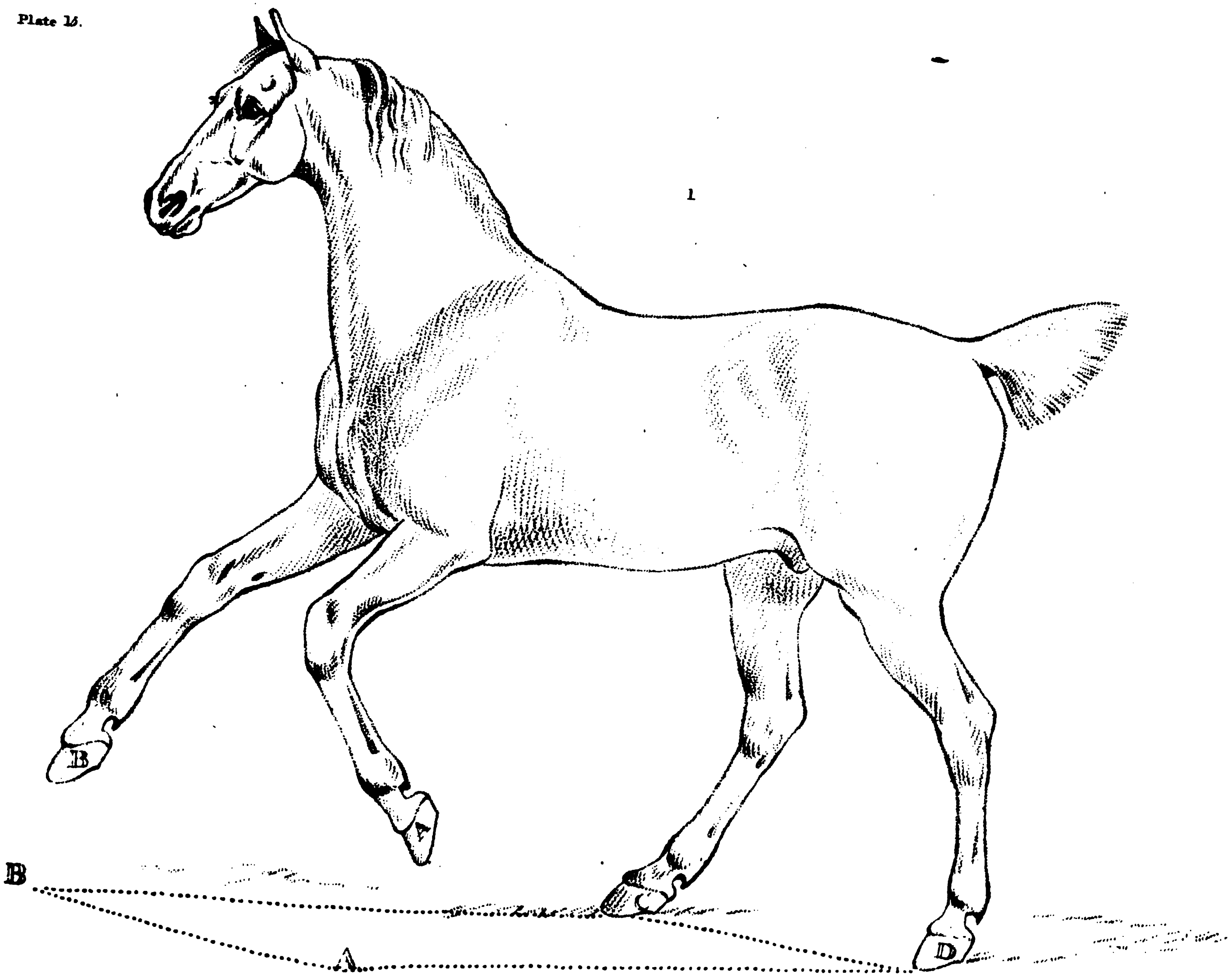
PLATE XV.

FIG. 1 repreſents the horſe in the canter, in which pace his legs deſcribe a rhomboidal quadrangle, A, B, C, D.

Fig. 2 repreſents the gallop. Letter A marks the ſpots which the hind feet occupied before they quitted the ground. Letter B marks the ſpots upon which the hind feet will alight when they have completed their action; the diſtance between A and B, therefore, gives the length of ground which is paſſed over at each ſtroke.

Plate 16.



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